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January
TENNESSEE VALLEY AGRICULTURAL CORRELATING COMMITTEE

Knoxville, Tennessee

Unnumbered Publication

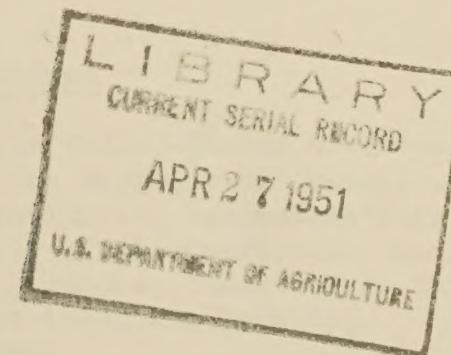
January 1951

X PROCEEDINGS

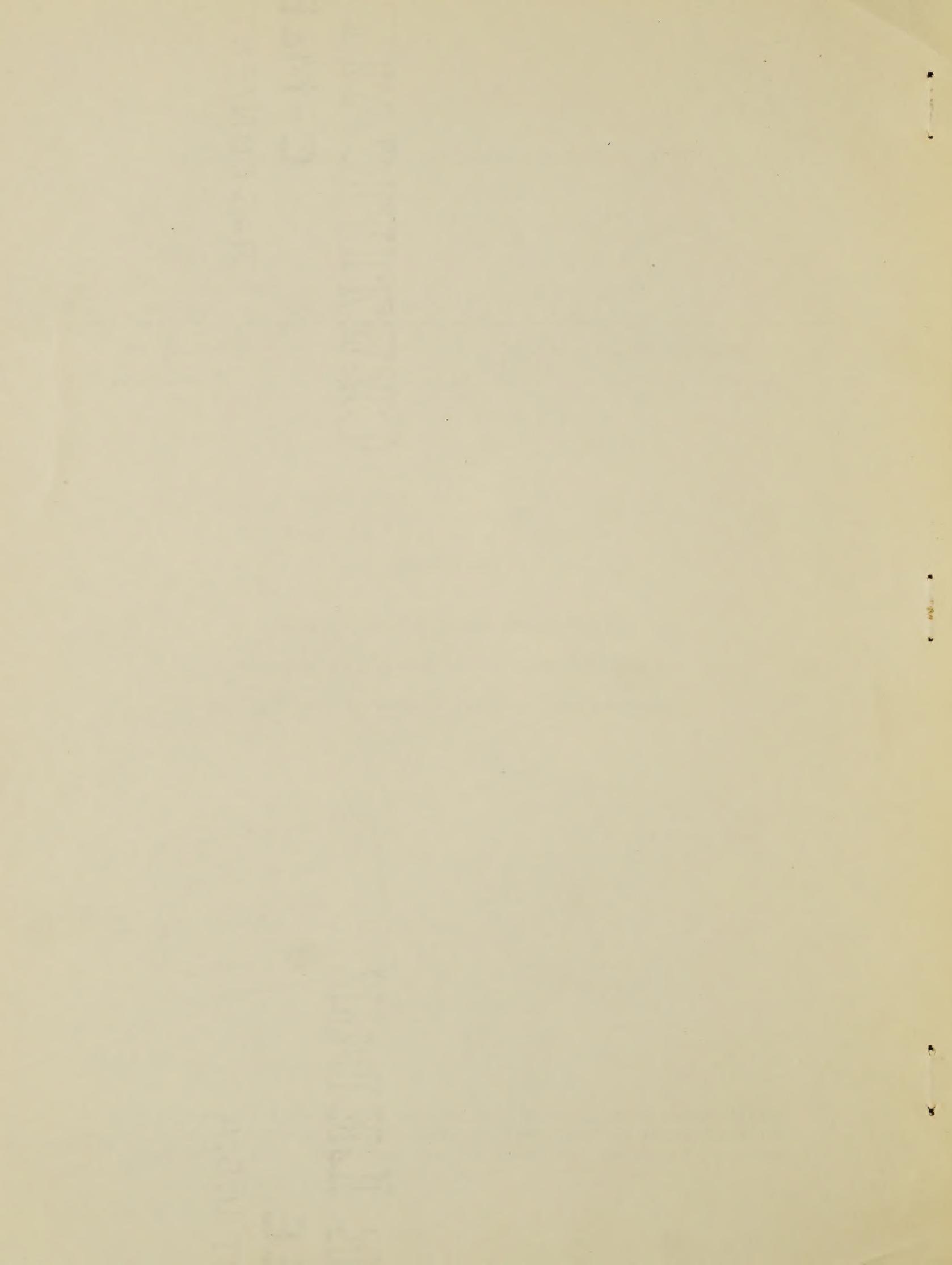
THIRTY-FOURTH VALLEY-STATES CONFERENCE

Andrew Johnson Hotel, Knoxville, Tennessee

Wednesday and Thursday, November 29 and 30, 1950 X



United States Department of Agriculture; Land Grant Colleges and Universities of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia; and Tennessee Valley Authority Cooperating



ACKNOWLEDGMENTS

Cooperating Agencies

Under a Memorandum of Understanding, dated November 20, 1934, the U. S. Department of Agriculture, the Tennessee Valley Authority, and the land-grant colleges of the seven Valley States expressed as their mutual objective in the Tennessee Valley: "To coordinate those phases of the research, extension, land-use planning, and educational activities of these agencies which are related to a unified, regional agricultural program."

Correlating Committee

To facilitate coordinated effort in meeting the problems of the region and to further development of a coordinated program, the Memorandum of Understanding provides for a Correlating Committee to consist of three members and an executive secretary.

Organization. Thomas P. Cooper, Chairman, representing the land-grant colleges; J. C. Dykes, representing the U. S. Department of Agriculture; J. C. McAmis, representing the Tennessee Valley Authority; C. F. Clayton, Executive Secretary.

Valley-States Conference

In order to facilitate discussion of regional problems and to receive advice and recommendations of responsible representatives of the cooperating agencies, the Correlating Committee meets at regular intervals with the deans and directors of the land-grant institutions and with designated representatives of the Department of Agriculture and the Tennessee Valley Authority. This group constitutes the Valley-States Conference. The chairman and the executive secretary of the Correlating Committee serve, respectively, as chairman and secretary of the Conference.

Standing Committees

On request of the Correlating Committee, the Valley-States Conference established three standing committees to which the Correlating Committee may refer problems or proposals for special consideration and recommendations or reports. These committees, established at the meeting of the Conference on April 6, 1949, are the Committee on Plant Facilities and Products, Committee on Water and Land Use, and Committee on Rural Facilities, Services, and Industry. The present membership of these committees is as follows:

Committee on Plant Facilities and Products. C. H. Young, Chairman; Walter S. Brown; Roland Crumpler; N. D. Peacock; C. F. Clayton, Secretary

Committee on Water and Land Use. Frank S. Chance, Chairman; Willis M. Baker; P. O. Davis; T. L. Gaston; C. F. Clayton, Secretary

Standing Committees - Continued

Committee on Rural Facilities, Services, and Industry. R. E. McArdle, Chairman; J. W. Moon; D. S. Weaver; H. N. Young; C. F. Clayton, Secretary

State Contact Officers

The Memorandum of Understanding also provides for the selection of a State contact officer by each of the seven land-grant colleges. The contact officer seeks to inform the college staff regarding the unified regional development program in the Tennessee Valley and to adjust and coordinate the State program with the Valley program.

Contact Officers. S. G. Chandler, Georgia; H. L. Dunton, Virginia; M. E. Weeks, Kentucky; W. D. Lee, North Carolina; E. C. McReynolds, Tennessee; L. A. Olson, Mississippi; R. M. Reaves, Alabama.

Committee on Tennessee Valley Program

To facilitate the work of State contact officers, each land-grant college selects from its faculty a Committee on Tennessee Valley Program. The State contact officer is a member, and usually the chairman, of this committee.

TENNESSEE VALLEY AGRICULTURAL CORRELATING COMMITTEE

PROCEEDINGS

THIRTY-FOURTH VALLEY-STATES CONFERENCE

Meeting at
 Andrew Johnson Hotel, Knoxville, Tennessee
 Wednesday and Thursday, November 29 and 30, 1950

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PROCEEDINGS OF THE CONFERENCE

SUMMARY

Agency Cooperation in the Tennessee ValleySpecial Advisory Committee (appendix, p. 81)

The Correlating Committee, in its report, submitted additional correspondence relating to the work of the Special Advisory Committee. After the reading of Mr. Gant's letter of November 17 (appendix, p. 82), the relevant discussion was as follows (p. 12):

Clayton. This letter is presented as a joint statement of the situation from Mr. Dykes and Mr. Gant. At least, that was our understanding of it, and if I am not correct in that, I wish to ask Mr. Dykes to clarify the situation.

Dykes. It is correct, Cap (Mr. Clayton), with one exception (and that was the point we couldn't agree on), that is, whether or not, by the Department's making SCS assistance available to districts, we abrogated the memorandum of understanding. On that point, I do not agree. George (Mr. Gant) and I simply couldn't reach an agreement on that point. With that exception, I think it is a fair statement of what has taken place. I don't agree with that position. George (Mr. Gant) knows that.

Cooper. You have heard the letter. . . . What is the desire of the group?

Brehm. I move that it be received, filed, and the matter terminated.

Gaston. I second the motion.

The motion was agreed to.

Final Report to Principals

The report of the Correlating Committee stated (appendix, p. 85): "In view of these developments, the Correlating Committee proposes to prepare and submit a final report to the principals on the assignments made to the Special Advisory Committee."

SUMMARY

Classification and Analysis of Farms in the Tennessee Valley

Proposed Review and Publication of Report of Study in Haywood County, North Carolina

Discussion of this topic (pp. 14-19) by the Conference did not seem to support the suggestion that the report of the study be revised and issued as a printed publication. Director D. S. Weaver, who canvassed the parties concerned in regard to issuing a printed publication, said (p. 15): "I was not particularly impressed with the enthusiasm for printing it. . . . I did not find, after circulating the (mimeographed) bulletin among my own people, too much enthusiasm for its possible use other than as a reference text."

Committee on Method and Procedure for Farm Classification and Analysis in the Tennessee Valley

The Correlating Committee reported (appendix, p. 86) that a committee, comprised of Lester E. Odom, Chairman, Samuel W. Atkins, H. J. Bonser, J. W. Moon, and Kenneth J. Seigworth, had submitted on September 19, a report entitled, "Suggested Outline of Methods and Procedure for Farm Classification and Analysis in the Tennessee Valley," and that copies of the report have been submitted to members of the Committee on Water and Land Use for their consideration.

The Correlating Committee reported to the Conference (appendix, p. 85) selection (but not actually appointment) of a committee, comprised of John Blackmore, Tennessee Valley Authority; Samuel W. Atkins, Bureau of Agricultural Economics; John L. Brown, Soil Conservation Service; Lester E. Odom, Division of Soil Survey; and Brice Ratchford, North Carolina State College, to review and revise the material of the Haywood County study for proposed publication. In the light of the discussion of the Conference, the task is to review the work in Haywood County, North Carolina, and similar work in the State of Mississippi, primarily from the standpoint of method, and to prepare a report dealing primarily with the methodology of farm classification and analysis studies. Study of the actual results of work in Mississippi and North Carolina would be made mainly as a guide to the evaluation of methods, and such results would be incorporated in the report for illustrative purposes only. In view of the emphasis on methodology in the proposed report, it was agreed that Dr. O. T. Osgood, of Mississippi State College, be included in the membership of a committee to be selected later for this assignment. The report, if approved, would be issued as a multilithed or mimeographed publication.

Standing Committees

The Correlating Committee reported that the following changes have been made in the membership of standing committees (appendix, p. 86):

PROCEEDINGS OF THE CONFERENCE

Committee on Plant Facilities and Products. Dr. Randall J. Jones, Mississippi State College, has been appointed to membership of this committee for a term of three years, beginning October 5, 1950, to succeed Dr. Ralph W. Cummings, whose term has expired.^{1/}

Committee on Water and Land Use. Mr. T. L. Gaston, Soil Conservation Service, has been appointed as a member of this committee for a term of three years, beginning on October 5, 1950, to succeed himself.

Committee on Rural Facilities, Services, and Industry. Director D. S. Weaver has been appointed a member of this committee for a period of three years, beginning on October 5, 1950, to succeed Director Frank J. Welch, whose term has expired.^{2/}

Relation of Tennessee Valley Watershed to Its Streams

Statement of Director Harry A. Curtis

Director Curtis' statement appears in the appendix, pp. 89-98. Director Curtis said, in part:

As all of you know, the TVA is attempting to carry out, in cooperation with the institutions and people of the Valley, a coordinated development of the resources of the area. One of the greatest resources of the Valley is the one that was least utilized in 1933, the river itself and its tributaries. Today, the river is serving the area in many ways. The once damaging floods have been brought under control, the main channel is now navigable from Knoxville to the mouth of the river, and its falling water generates electric power. The low rates for electric power have brought about an increase of industry and has benefitted agriculture in the Valley. Low-priced electric power flows into the homes and villages, towns, and farms of the Valley. The individual purchaser of electricity in the Valley pays about half the national average rate and uses approximately twice as much electricity. It seems obvious that all of us who live in the Valley have an interest in and a stake in the development of the river as one of our chief resources. We want to keep our rates as low as possible, we want to develop new industry, we want the benefits of cheap electricity in homes, and we mustn't forget that we who live in the Valley must, by law, repay to the Federal treasury the total investment in the power facilities developed by the TVA. But whether we live in the cities or on the farms, we have a stake in the river as one of the great resources of this area (p. 90).

^{1/} Dr. N. D. Peacock has since been appointed to this committee to fill the unexpired term of Dr. Randall J. Jones.

^{2/} Mr. J. W. Moon has since been appointed to this committee to fill the unexpired term of Mr. E. H. White.

SUMMARY

After reviewing some of the points developed in his statement to the last Conference (Proc. XXXIII, pp. 125-133), Dr. Curtis said:

The TVA has considered the various possible changes in land use on the Valley watershed. It is idle to consider what changes in land use might be favorable to river flow without regard to their effect on agriculture. The criterion is that any proposed change in land use must, in the first place, be one that is favorable to agriculture; otherwise, it will not be brought about, because most of the land is in private ownership, and any proposed change in land use must be made by people who own the land; the farmer will not make changes unless he considers them to be to his interest. There is going on in the Valley an expansion of the so-called winter pasture program. We have tried to see what that would mean with respect to the reservoirs (p. 95).

• • •

The TVA is interested chiefly in what the winter pasture program might mean in respect to river flow. One effect of changing from summer-growing crops to the so-called winter, or winter-spring, growing crops, so far as stream flow is concerned, is to shift the period of maximum transpiration (p. 96).

• • •

In general, we know that the change in period of maximum transpiration would benefit the reservoirs, and the increased revenue from power production might amount to some hundreds of thousands of dollars, but it is difficult to make an estimate in quantitative terms (p. 97).

• • •

I have tried to present the general picture of what effect there might be on the streams following changes in land use which would meet the criterion of being acceptable or favorable to agriculture. More data are needed on the prevailing set-up. TVA is now planning to concentrate its attention on subwatershed and small problem areas. Again, I come back to saying that what happens on the land affects the river, and what happens on the river is of interest not only to the people of the cities but also the people who live on the land (p. 98).

Statement of Dr. R. E. McARDLE

Dr. McARDLE's statement appears in the appendix, pp. 98-101. Dr. McARDLE said, in part:

To achieve the finer cooperation that I think Dr. Curtis was urging upon us, it seems to me, will require, first, a thorough examination

PROCEEDINGS OF THE CONFERENCE

of the objectives that we have in mind and the problems that we are going to have in reaching them. To illustrate what I am talking about, I think one of the first things that would be needed, Director Curtis, is an inventory of the land areas in the Valley, from a water resource standpoint. It may be that that has already been done. I have been away for so long that I haven't kept in touch, but I would think that that would be one of the first things that we would want to do: to make a study immediately, I should think, of the whole area of the Valley from the standpoint of the water resource itself. Where are the high-yield areas, the low-yield areas, from the standpoint of water load? Where are the areas that are especially susceptible to erosion? Where are the areas that are especially susceptible to local floods? If we can get anything on groundwater conditions, put that in. I am not trying to give a complete working plan here, but just indicate some of the basic knowledge that I think is needed. Then I think these areas should be classified in terms of their critical importance from the water resource standpoint again; and on these critical areas (we wouldn't take areas of no importance from the water standpoint, but we would concentrate on areas of true, critical importance) we would try these other things that Dr. Curtis is talking about: different methods of farm management, how they affect the water yield (p. 99).

. . .

Mention was made of 4 million dollars of electricity which could be gotten (if this proposal were possible to get this result) from taking all the trees off a particular area. Dr. Curtis realized, and he tried to impress upon us, the practical dangers of trying to take, for example, an area of 108 inches of rainfall, with deep soils, with perhaps a little different forest type, and then to apply results from that area generally. I have made a rough calculation here, and Bill Baker better check this one for me, but the returns from this particular area that was mentioned was about one-seventh of the total forest area in the Valley. The returns from forestry in the Valley are around 200 million dollars a year, so that one-seventh of that would be about 28 million dollars from wood products. However, I think that includes rather heavily the value of finished products; and maybe that isn't a fair way to do it, so just take the value of the timber that is cut in the Valley now, which is about 50 million dollars a year; one-seventh of that is about 7 million dollars a year. I gather from the last trip in which I was over in that area that it could produce a lot more wood than that, perhaps three times that much, so that if I were making some guesses, I would say that from wood in that area maybe we could get 15 million dollars or 20 million dollars, just from raising wood; so we can get a lot of valuable water, get a lot of valuable pastures, and get a lot of valuable other things. We have to fit these things together so that we can get the most of all of them. I think that is just what he was talking about and asking us to see: settle on the objective, to see if we couldn't focus on the problems that might be encountered in reaching those objectives (p. 101).

SUMMARY

Statement of Director W. M. Baker

Director Baker's statement appears in the appendix, pp. 107-109. Director Baker said, in part:

The progress and momentum developed in the Tennessee Valley program to date now permit a greater selectivity in the activities which should be intensified and concentrated in areas where problems and opportunities are most in need of increased attention. Many such areas occur within the Valley's small tributary watersheds where important local problems of flooding and drainage, stream pollution, public health, erosion and siltation are inseparably associated with opportunities for improved farming practices and better land use; reforestation, forest management protection, and utilization; industrial development, community planning, and many other measures of social and economic importance. In the aggregate these local problems and opportunities add up to the most urgent needs of the Tennessee Valley for good watershed management and progressive development.

Consequently, the TVA now proposes an intensified program of tributary watershed development with emphasis on integration of activities within critical problem areas. The colleges and other State and local agencies working with TVA have already assisted farmers and landowners in these areas in programs of better land use and resource development. Intensification of these measures within small watersheds should give the several agencies a more effective way to speed up the process of optimum land and water use and general improvement of these areas (appendix, p. 108).

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Intensified activities of watershed development will inevitably focus increased attention on the need for more and better information of many kinds, and especially on water-land use relationships. Improved land use adjustments should be based not only upon knowledge of their immediate effect on landowner income and local economy, but also upon knowledge of their effect on the continued productivity of the land and on the optimum use of land and water resources. There will be need for hydrologic research, studies of improved cropping and land-use practices and better utilization of resources, intensive investigations of social and economic conditions and opportunities for development, and bench-mark surveys from which progress of many kinds can be measured. The program anticipates intensification of research as well as of action (appendix, p. 108).

Statement of President C. E. Brehm

President Brehm's statement appears in the appendix, pp. 109-113. President Brehm said, in part:

PROCEEDINGS OF THE CONFERENCE

Now, no one appreciates more than I the great contribution that the unit test-demonstration farm program has made in bringing about a shift from row crops to grass; with the grass comes livestock, and along with that has come, of course, better living in the homes. One of the greatest contributions that has been made to that is electricity. You get a cycle there; many things which are interrelated.

Education, however, is a cumulative thing. There are different levels of people to educate, and that is particularly true of agricultural extension. We always have the elementary group to educate; but in extension work, especially, teaching must be adjusted to the level of education. The thing about extension education is that it is a cumulative thing; and certain generations you bring along cumulatively. You can't continue to teach the same individual the same thing over a period of 20 years or approach the same problem over a period of 20 years in the same way.

I don't by that mean that we have dropped the idea of the unit test-demonstration farm program on each individual farm, but I do say that we should be working in the various watersheds that comprise the Tennessee Valley; that we should be defining those watersheds. After all, people live in them, and they are going to continue to live in them, and we want them to; and there are going to be forests there, and there are going to be farm lands there. A big part of the area is going to be in the farms of the individual farm people who live there. These people on the farms are going to have to make a living. As has been expressed here, probably we should be making a survey and a study of some of these watersheds; defining them; determining the number of families that are in them. I wish that we could study the soil types, the slopes, what the problems are; and then I think we should approach from a community standpoint, across the whole front, those problems that confront that community, rather than those that pertain merely on the individual farm. I think that is the point, in these watersheds particularly, to which the unit test-demonstration farm program has progressed at this particular time (appendix, p. 111).

. . .

I should hesitate very much, Dr. Curtis, to attempt to take that paper of yours--now, I am being candid--to a group of people that you are going to have to deal with in these watersheds and submit it to them in a way that they would understand. You are going to have to take that program and adapt it to the locality, the type of people and in terms of practices that they can put into application. Unless something is done about that--we can talk about it, but where the work must actually be done, little can be accomplished, whether the job be out on the land or in the forest. My philosophy about that is this. This group that is represented here--the Department of Agriculture, the extension services, and the experiment stations, in cooperation with the Tennessee Valley Authority--in your respective States, might largely take the initiative. Let's pick out a watershed or two; define them; lay out their boundaries; the number of families that are in them; what the problems are; and then set up a program. Include not only the experiment stations, agricultural

SUMMARY

extension, but all these other agencies, Federal and State, which can make a contribution. I am talking now about the Production and Marketing Administration, the Soil Conservation Service, the Farmers Home Administration, and your Federal and State Forestry Services, and probably your Game and Fish; and bring them into that picture and set up some kind of program (appendix, p. 111-112).

Statement and Proposals of Correlating Committee

The statement and proposals of the Correlating Committee appear in the appendix, pp. 86-89.

In its statement, the Correlating Committee said, in part:

Of special interest to the Tennessee Valley region is the possible curtailment of fertilizer output by TVA plants by reason of the use of these facilities to meet national defense requirements. The Committee on Plant Facilities and Products might usefully explore with the Committee on Water and Land Use desirable ways and means of adjusting to this situation, should it arise, with least damage to land-water conservation and agricultural production. These two committees, as well as the Committee on Rural Facilities, Services, and Industry, are requested to assemble full information as to program outlook in the field of fertilizer and munitions development and submit to the Correlating Committee appropriate recommendations in their respective subject-matter fields (appendix, p. 87).

The Correlating Committee can provide each of the standing committees with a tabulation to show current and proposed projects and activities in these, and other, phases of work in the Tennessee Valley (appendix, p. 87).

The Correlating Committee also submitted the following proposal (appendix, p. 88).

Subject to the concurrence of this Conference and to the approval of the principals, the Correlating Committee proposes, also, to encourage and assist the initiation of region-wide work to:

1. Identify and set forth the "specific" problems and objectives in land-water relationships within the Valley--by subwatersheds and minor watersheds to the degree necessary.
2. Develop suggestions and recommendations for each type of research work, educational activities and technical and other assistance needed, including the extent to which each may serve to meet the specific problems and attain objectives that fall within the Tennessee Basin development program.
3. Recommend an integrated program of research work, educational activities and technical and other assistance needed for the

PROCEEDINGS OF THE CONFERENCE

Tennessee Basin in line with the "specific" objectives mentioned in item 1 above.

With the view of further establishing these broad guides as soon as possible, the committee believes this job should be completed in 1952 and the findings and recommendations published early in 1953.

The Correlating Committee proposes that plans for this work be prepared and submitted to it not later than March 1, 1951. The general plan of work can then be prepared and presented to the Conference at its meeting in April. It is hoped that work can be started in the spring.

The following motion, made by Dr. R. E. McArdle, was adopted by the Conference (p. 72):

I move that arrangements for getting this plan made for the two-year job be left to the Correlating Committee, with the suggestion that the Correlating Committee consider the desirability of accomplishing the making of a plan by engaging a small task force of technicians who will actually put the plan together; and that the Correlating Committee further make the fullest possible use of the present standing committees of the Conference to review that plan before it is presented to the Conference.

Address of Chancellor John R. Hucheson

Chancellor Hucheson included in his address a tribute to the late Dr. Harcourt A. Morgan, concluding with these words (appendix, p. 102):

We in the Valley are indeed fortunate to have had the benefit of his experience, vision, and wisdom in the early years of our joint program. I like to believe that God has something for men like Dr. Morgan to do "Over There," and that he is now taking orders from the Captain of his Salvation.. I know that a measure of his spirit still lives among many who were associated with him.

On the subject of the joint agricultural development and watershed protection program in the Tennessee Valley, Chancellor Hucheson said, in part:

I have always had the idea that Congress intended to establish in the Tennessee River Valley a unique demonstration of how a large river and its tributaries can be harnessed in interest of national defense, flood control, power development, watershed protection, and regional development. I have also had the idea that Congress expected the Authority in setting up and carrying out this demonstration to utilize and coordinate the activities of various State and Federal agencies conducting programs with similar objectives. The purpose of this demonstration was to conserve and develop the natural and human resources of this Valley so that they would make maximum contribution to a better way of life, not only for the people who live in the Tennessee Valley, but for all citizens of the Nation and the world (appendix, p. 104).

SUMMARY

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In planning the future development of our joint program, let me express the hope that we may be able to hold fast to that which is good--"Come back to the moorings"--; but at the same time let me express the additional hope that we may be able to enlarge our vision, raise our sights and "press toward the mark for the prize of our high calling" (appendix, p. 107).

Next Meeting of Conference

It was agreed to hold the next meeting of the Conference in Knoxville, Tennessee, on Wednesday, April 11, 1951 (p. 86).

OPENING OF THE CONFERENCE

Wednesday, November 29, 1950

Dean Thomas Cooper, Chairman of the Conference, called the meeting to order at 9:30 a.m.

(For the roll of the Conference, see appendix, p. 77; and for the program of the Conference, see appendix, p. 80.)

REPORT OF CORRELATING COMMITTEE

Dean Thomas Cooper, Chairman of the Correlating Committee, presented the report of that committee (appendix, p. 81). Proceedings relating to this report follow.

PROGRESS REPORT

DISCUSSION

Agency Cooperation in the Tennessee Valley

Special Advisory Committee (appendix, p. 81)

Cooper. After all, all of you here may have had placed before you the correspondence during this past year with reference to agency cooperation in the Valley. Is my surmise correct?

Clayton. I believe that most of it has been sent out, Dean Cooper. This is the most recent letter, which was written to you as Chairman of the Correlating Committee, from the sub-committee of the Special Advisory Committee, Mr. Dykes and

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Clayton. Mr. Gant. I don't know whether that letter has been sent around.

Cooper. Perhaps I had better open with that. This represents, in a way, a summary. This is addressed to me from Mr. Gant (appendix, p. 82).

Clayton. I think we should explain, Dean, that this letter is presented as a joint statement of the situation from Mr. Dykes and Mr. Gant. At least, that was our understanding of it, and if I am not correct in that, I wish to ask Mr. Dykes to clarify the situation.

Dykes. It is correct, Cap (Mr. Clayton), with one exception (and that was the point we couldn't agree on), that is, whether or not, by the Department's making SCS assistance available to districts, we abrogated the memorandum of understanding. On that point, I do not agree. George (Mr. Gant) and I simply couldn't reach an agreement on that point. With that exception, I think it is a fair statement of what has taken place. I don't agree with that position. George (Mr. Gant) knows that.

Cooper. You have heard the letter going over the various matters that have occurred in the past few months. What is the desire of the group? Do you wish to discuss this, or does the matter still lie in the hands of the Special Committee?

Brehm. Mr. Chairman, I assume that this is a progress report.

Cooper. No, it is a report.

Brehm. I move that it be received, filed, and the matter terminated.

Gaston. I second the motion.

The motion was agreed to.

Classification and Analysis of Farms
in the Tennessee Valley

Proposed Review and Publication of Report
of Study in Haywood County, North Carolina (appendix, p. 85)

Clayton. In the letter that Dean Cooper read you, reference was made to the study in Haywood County, North Carolina. At the last meeting of the Conference, the question arose as to whether the results of that study should be looked over, revised, and issued as a printed publication. I believe a motion was adopted, suggesting that that be done, or at least that the

FARM CLASSIFICATION AND ANALYSIS

Clayton. feasibility of issuing a printed report be considered. The matter has been investigated by Dean Weaver, of North Carolina, who has canvassed the agencies concerned, and Dean Weaver agreed to make a statement on the status of the matter at this meeting. I assume that he will do so when he comes in.

Dean Weaver came in at this point.

Standing Committees

(Appendix, p. 86)

Clayton. While we are waiting for Dean Weaver to get seated, let me go over this a little bit. There have been a few changes in membership of the standing committees. Dr. Randall Jones, of Mississippi, has been appointed to membership on the Committee on Plant Facilities and Products for a three-year term, to succeed Dr. Cummings, whose term expired. Mr. T. L. Gaston, of the Soil Conservation Service, has been appointed to the Committee on Water and Land Use for a three-year term, to succeed himself, and Director D. S. Weaver to the Committee on Rural Facilities, Services, and Industry, to succeed Dr. Frank J. Welch, whose term has expired.

Next Meeting of Conference

(Appendix, p. 86)

Clayton. It is recommended by the Correlating Committee that the next meeting of the Conference be held in Knoxville, on Wednesday, April 4, 1951.

After we have heard from Dean Weaver on this question that is up, Dean Cooper, I think that covers everything the Correlating Committee has to report.

Cooper. Do you wish to confirm the meeting date of April 4?

Brown. Mr. Chairman, I think the southern directors, at their recent meeting in Washington, agreed to have their spring meeting on April 3 and 4.

Clayton. Knoxville is suggested as the place. We can arrange the date any time in April convenient to the Conference.

Cooper. Will it be satisfactory to you to try to arrange for a date some time in April, in Knoxville, that the committee will work out? Is there any objection?

Cummings. Is there any reason why we can't set an alternate date here?

PROCEEDINGS

Clayton. Will April 11 be all right?

Cummings. I move that we set it on April 11.

Cooper. Does anyone have any objection to April 11? Hearing no objection, I take it you wish it on April 11.

Clayton. In Knoxville.

Classification and Analysis of Farms
in the Tennessee Valley

(Continued from p. 13)

Proposed Review and Publication of Report
of Study in Haywood County, North Carolina (appendix, p. 85)

Cooper. Director Weaver, just as you were on the way up here, it was called to our attention that you had a report and a comment to make with reference to the study in Haywood County.

Weaver. Dean Schaub had a lot to do with the preliminaries, and perhaps I am not too well informed on some of the background. Anyway, I wrote Mr. Clayton on November 9 regarding the result of the canvass of the States in the area that I had made, together with the Soil Conservation Service, Tennessee Valley Authority, Soil Surveys Division, and the Bureau of Agricultural Economics as to their desires in regard to the printing of this publication on the classification and analysis of farms in Haywood County.

Writing each of the directors of the States concerned and the designated agencies, I received replies from four agencies and two States that were definite enough to put in a table. The other replies couldn't be added up, so I didn't put them in the table. I'll read those for your information. I suppose there is no objection on the part of any State or agency to reading what you wrote me. The Soil Conservation Service said that they could use 500 copies and would be glad to pay an important part to cover them. TVA did not designate the number of copies but could contribute \$200, if necessary. The Soil Survey desired 10 copies; and no reference was made to the contribution. BAE could use 200 copies and could contribute, but would prefer not to. Virginia would take from 50 to 100 copies and would pay for the number received. L. I. Jones, who has had good training, comes out frankly and says that he doesn't want any.

That is the situation. I was not particularly impressed with the enthusiasm for printing it, so the matter stands

FARM CLASSIFICATION AND ANALYSIS

- Weaver. exactly at that point, as I reported to Mr. Clayton in my letter of November 9. That is the situation, gentlemen, as I see it. North Carolina will be glad to join in and take our proportionate share, whatever the other institutions agree to do. I did not find, after circulating the (mimeographed) bulletin among my own people, too much enthusiasm for its possible use other than as a reference text.
- Cooper. Director, do you plan, even with that limited number, on publication?
- Weaver. I don't plan to, Sir. As I say, I wasn't present at the original consideration of this matter and don't find much correspondence regarding it; and I am a little bit lost and a small bit embarrassed about the indefiniteness of it from our point of view.
- Curtis. There are about a thousand copies that people here would like to have, apparently.
- Weaver. I have prices on what it could be done for.
- Clayton. May I say a word on this? From the correspondence I have seen, I think the most fruitful suggestion made on this, aside from dropping the matter as it is now, would be to reexamine the preliminary publication primarily from the standpoint of method. If any revision of this publication is put out, make it primarily a revision that would reflect methodological suggestions, rather than just a study in itself. With that thought in mind, the Correlating Committee has already authorized the setting up of a committee of that kind, comprised of John Blackmore, Tennessee Valley Authority; Samuel W. Atkins, Bureau of Agricultural Economics; John L. Brown, Soil Conservation Service; Lester E. Odom, Division of Soil Survey; and Brice Ratchford, North Carolina State College. And, Director Jones, we should like to add to that committee, if agreeable, Dr. Osgood, who worked on this sort of thing over in Mississippi. If we are going to look at this from the standpoint of method Mac (Mr. McAmis), it would seem to be desirable to add Dr. Osgood to the membership of the committee.
- Jones. There is the reason for this undiplomatic letter. We felt that we had some studies in this field that also merited consideration for publication.
- Clayton. Some of these letters that we have suggested that data of a study of a little area there in North Carolina were pertinent just to that area, but it occurred to the Correlating Committee, in its discussions, at any rate, that if we looked at this from the standpoint of a method of doing

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Clayton. a job of this sort, and maybe revise the material from that standpoint, that it might have a broader use. I think, so far as the Correlating Committee is concerned, our own suggestion, Director Weaver, would be to select a group, including Osgood, of Mississippi, to examine this material primarily from the standpoint of method, of what it might contribute to method; and if they think, from that standpoint, that it would be useful to publish something, then to put it out as a multilithed or a mimeographed publication for use in that way. If that isn't worth doing, then we had better quit where we are, because we haven't much support of the proposal to put out a printed publication.

If that suggestion is agreeable to the Conference, the Correlating Committee will try to go ahead along that line. Otherwise, we feel it had better be dropped just where it is.

Cooper. I suppose the Correlating Committee, if it were thrown in their lap and had to deal with it, naturally would refer it to an appropriate committee to study the problem of method; and, I presume, advise us whether a statement on method should be published.

Dykes. Right.

Cooper. You have the report and statement. Is there any comment that you wish to make? I would like to know specifically whether this suggestion appeals to Director Weaver, since he has been working on this.

Weaver. I feel like you, as mentioned a moment ago, there isn't a great deal of interest in having it come out as printed material. In view of the relatively small expense of having another type of duplication, if this committee can revise it and make any changes they think necessary and it meets the approval of the Correlating Committee, it will suit me, so far as North Carolina is concerned, to reproduce it in multilithed or some other form similar to the form it is in now.

Cooper. Any suggestions and additions to this that you wish to make?

Daughtrey. Mr. Chairman, I believe a summary report of what is practical and usable in this farm-planning survey would be the type of thing that would be most helpful to all of us. The people to whom the result of this study will be most helpful, it seems to me, don't have the time, and you are never going to get them to pour through the volume as it is now set up. If the conclusions and procedures which are found to be usable and effective could be set up, I believe that would give the report larger use than in its present form.

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Young.
(H. N.) I should like to ask one question. Is this a procedure on research method? Are we proposing to set this up as an example of research procedure?

Weaver. You will have to inquire somewhere else. I wasn't present at the birth of this thing.

Young.
(H. N.) If that is the proposal, I am against it.

Cooper. As I remember, I don't believe it was set up as a research method. I don't think there is anything of that kind involved in it. I think, rather, that it was set up with a viewpoint to setting a pattern of how cooperative endeavors could be carried out in a county and in an area. It was hoped, at least by the sponsors, that it would have an applicability to at least most of our States.

Clayton. Director Jones thinks, if I understood what he has said in the past, and Dr. Osgood thinks, and I think, and I believe others think, there are problems of method in it that are worth investigating, worth looking into; and that is what we propose to do, Dr. Young.

Young.
(H. N.) If we want method, we can put that out in a very limited edition. If we had three or four copies in Virginia, that is all we would need.

Clayton. That is right. That is why we say put it out in mimeographed or multilithed form, chiefly for people working in this field and who are interested in it from the standpoint of method.

Cummings. I didn't visualize it as a research method publication but as a planning procedure.

Clayton. That is right, in a sense. I don't want to argue the point. I am just airing my view that there is a methodological problem here.

Young.
(H. N.) I am not arguing the point; I am just looking for information.

Clayton. I don't know that I can give information. I can just state the viewpoint that led the Correlating Committee to suggest this committee that we propose to set up here, including Dr. Osgood, who is also working on this type of study. Every member of this proposed committee has had some relation to this type of study. They are asked to look at the job from the standpoint of a way of going about this type of analysis--a good way, poor way, or a way that can be improved, or what their suggestions are. Now, I regard that

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Clayton. as a consideration of method, but maybe there is another name for it. At any rate, that is what we suggest the committee do.

Cooper. That means that the group here leaves in the hands of the committee which it is proposed to set up for this the assignment to study the material and review the field experience from the standpoint of method. I presume from the standpoint of the Correlating Committee, at least, unless this group provides for some other action, that the suggestions and recommendations of the proposed committee probably would be utilized.

Does that run you into any difficulty along the line, Dr. Young?

Young.
(H. N.) I just want to get clear in my mind what this is considered to be, a research method or a planning job. I just don't understand it. I don't see any point in having 40 or 50 or 100 copies just to find out if it is a research method. I doubt that it is a research method.

Clayton. I can only testify to this: since 1943 there has been more looping the loop over ways of going about jobs of this sort than any other one topic that I have had any contact with. We still are not of one mind as to the best way to do a job of this sort, or whether a job of this sort is worth doing, from the standpoint of what you can get, and so on.

Young.
(H. N.) It is always a desirable thing to investigate new methods of doing things.

Clayton. One of the principal things said to me, too, Dr. Young, in connection with this discussion has been: We can't answer these questions as to the best methods to use in studies of this type until we actually try methods in the field. One reason for making this study up in Haywood County was just that. Try to see what we can do and then examine our ideas as to methods in relation to what we find by actual experience in the field.

All that the Correlating Committee is proposing is: let's get a group together, comprised of people who have been identified with this work, and ask them to examine it, after having worked on the job in the field to see how it checks out with what they thought they could do; and, in the light of their experience, to recommend such changes in methods as that experience may suggest.

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Young. (H. N.) One of my objections is that it has very limited application. It has application in Haywood County. To study methods used in this field and find what other people have done is a very valuable thing. We don't need a hundred copies for that purpose.

Jones. Is there any proposal as to what you expect to do with Dr. Osgood's study?

Clayton. Well, I should think that ought to be examined. That should come into the discussion and experience of this group as one basis of their comments on limitations of the methods we followed in Haywood County, procedures that should be followed, and so on. That is one reason a number of people have suggested that Dr. Osgood be asked to help on this, because he has a background of actual work in this field. Of course, if you are simply going to publish this as a matter of data gathered there in Haywood County, there wouldn't be any particular point to putting Dr. Osgood on the committee, as I see it. But since it is proposed to examine our total experience in the setting of method--the best way of going about a job of this sort that can be worked on in Mississippi, North Carolina, or elsewhere--it would be a very good idea and very helpful to have Dr. Osgood also working with the committee.

Cooper. Is there anything further on this subject that you wish to bring up?

ADDITIONAL PROPOSALS AND RECOMMENDATIONS

For additional proposals and recommendations of the Correlating Committee, see p. 54.

RELATION OF TENNESSEE VALLEY WATERSHED TO ITS STREAMS

DISCUSSION

Statement of Director Harry A. Curtis

Director Curtis' statement appears in the appendix, pp. 89-98.

Cooper. This is a very interesting subject. Is there any discussion?

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Young. I would like to come back to that question of cutting the trees off. Do you mean there were 17 inches of runoff?

Curtis. By the actual measurement in the Coweta area, the water yield was increased by that amount.

Young. What replaced the trees?

Curtis. In that particular area, year after year, they cut the tree sprouts. They have another area where they cut all the trees and let them lie, but afterward allowed the forest to re-establish itself. That was done seven or eight years ago. In the first year, they got the same effect as on the other watershed, i.e., an increase of 17 inches. However, the increase dropped off as the trees reestablished themselves. The thing that surprised me was that now, after a number of years, the effect is still persisting. In the area where the trees were cut down from year to year and allowed to lie, it is obvious that in the course of time the trees will decay and the forest litter will oxidize and disappear. The native sod appears to be coming in. Apparently the processes are well balanced so the slope will eventually have a native sod on it.

Young. The forests are cut and then burned over?

Curtis. In Coweta, they took another forest and overgrazed it. They had left then all the disadvantages and few of the advantages. They had erosion and rapid runoff when cattle overgrazed the area.

Jones. In the connection of cattle grazing in forests, is there any damage in grazing in forests? Are there any actual figures?

Baker. There hasn't been very much experimental work in the Valley. . . .

Jones. We need some experiments on that. We all say that it shouldn't be done, yet we all go ahead and do it.

Baker. There has been a great deal of work done in Indiana in the Corn Belt where woodland grazing is extensive.

Cummings. Actually, your damage to woodland grazing applies particularly to hardwood forests on sloping land, does it not? Actually, when you get into the lower coastal plain area where pine is the native vegetation, you can improve things by grazing out the deciduous vegetation.

Jones. Unless it is hogs or sheep.

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Curtis. I had lunch a few days ago with a former TVA employee who is now living at Winchester. He is now making his living by operating some big powerful machinery clearing wood lots. He cuts down the trees, burns them up, tears off the small stuff, levels the land. Then the farmer fertilizes it and puts it into pasture. The total job costs the farmer about a hundred dollars an acre. I said, "Well, how can the farmer afford anything like that"? He said, "He is up against the problem of wanting more pasture. He can go next door and buy pasture for \$200 an acre, but if he can get his own land in pasture for \$100 an acre, he is that much better off." That is what is happening under our expanded pasture program.

McArdle. Dr. Jones, you were talking, I guessed, to the point of whether it was profitable for a farmer to use woodland as pasture. There isn't very much information on that score, particularly not in the Valley. There should be because that is about the only way you can convince most farmers to stop grazing. By way of a summary, hardwood lands should not be grazed from the standpoint of forestry, at any rate. If it has got a lot of little trees coming on, a lot of brush in there, then it is not grasses. Foresters do not recommend grazing hardwood stands because, if the cattle do not have very much grass to eat, they will chew up all the little trees that come along.

From the standpoint of water production, again it is harmful to graze hardwood stands. I can take you to places right here in the Valley, if they haven't changed during the last year, where the soil has become compacted by grazing, where the reproduction has been destroyed, and where the land is unfit for the growth of either trees or grass. I fail to see how a farmer can make any money out of grazing cattle on a few scattered patches of grass, with the brush all gone, the few little trees that they might bite on are gone, and any nourishment is gone. Not only that, but if you drive down through these narrow valleys and look up, you will see a little grove of trees. The trees are good for water yield. Get out of your car and walk up to one of these hardwood stands and see what you see. You will see little pebbles upon a pedestal. I am thinking of one place now in the Little Tennessee watershed. The mental picture is before me as I am talking here of a grassy pasture outside, and this woodland, from the road, looks pretty good. But if you will go up there, you will find, from the standpoint of getting water, useful water, into the streams, that pasture is worth a good deal more than that stand of trees, grazed as it is. From a forestry standpoint, that stand of trees is going out of existence because when the trees are cut, there will be no new trees to replace them.

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Curtis. Most cattle have a very great fondness for the better types of trees, too.

Brown. Dr. Curtis, what data do you have as to the useful value of grasses grown under trees?

Curtis. I will have to leave that to someone more familiar with it.

McArdle. The kinds of grasses you can grow, Director Brown, are not the best for forage. The Southern Coastal Plain type is all right, but many people make a mistake, I think, even in that pine and cottonwood, in going by and seeing the lush vegetation on the ground and thinking it is fine for grazing. I guess we don't know how to approximate some of these things. The only way we could figure out this problem was to put some cows in there and see what they ate. I know it sounds foolish. They ate everything; and I assume in the wintertime, in the midst of greenery, you could hang your hats on their ribs. They won't produce under such conditions; they won't survive under those conditions. Another thing that we found was that a cow would have to be about as big as a three-story house to hold enough to get necessary protein. There are a lot of carbohydrates there, but no protein; so the feeding of cotton-seed meal and certain base minerals was essential.

Most of the experimentation in this, perhaps I should say, was started with pure-bred animals and put on very high, very expensive pastures. What we did was buy local stock, what the local people had, and see what we could do starting from there. Some of the herds were grazed as local folks did, and some in other ways, but all of them involved supplemental feeding. As I remember, one winter the herd handled as local folks did lost about 85 pounds, whereas the herds given a supplemental feeding gained over a hundred pounds. The supplemental feeding caused them to forage around through the woods and get the roughage that they wanted, whereas the other herd was too weak to walk, but they just lay in one spot and chewed on some peanut hay. This illustrates one difficulty about grazing those pine stands, particularly.

I would say, generally speaking, hardwood stands are not profitable for grazing from the standpoint of the farmer; are not profitable for grazing from the standpoint of tree production; and are not profitable for grazing from the standpoint of water production. I think you can wipe out grazing of hardwood forests.

Baker. Dr. Hursh has been studying conditions outside the Coweta area. I don't recall the exact figures, but they are something like this. They found an average of six or seven summer floods. From measurements they made, they came to the conclusion that about 15 percent of the area was distributing the major amount of 85 percent. I am not sure of that figure of the summer runoff. That 15 percent of the area was no-man's land above the

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Baker. cropland and below the well-timbered hills and ridges, an area that was neither woodland nor pasture. His estimate was that a very large percent of that runoff came from 15 percent of the area.

Cummings. That is very damaging.

Statement of Dr. R. E. McArdle

Cooper. Dr. McArdle, have you any further comments to make at this particular stage of the game? I want to advise you that this isn't the place where you make a speech; this is the place where you are entering into the discussion that has been opened up by Dr. Curtis.

Dr. McArdle's statement appears in the appendix, pp. 98-101.

Curtis. That figure of 200 million will have to be boosted (p. 101). Mr. Baker tells me the actual yield here in the Valley, under forest management, would be three or four times the 200 million dollars. I should say that TVA, because it has this large investment in dams and reservoirs, is making, all over the Valley, rather careful hydrologic studies, so we will have a very good basis for determining effective land use. When we come to small areas, we are studying Chestee, which has been selected as the first of our small areas on which to concentrate. There, for the past six years, we have had many ways of measuring rainfall. We have recording gages in the wells. We are establishing a hydrologic basis for any changes that may be brought about in the Chestee watershed. I think you are dead right; it is desirable to study these problems and arrive at a balance where the greatest benefit can be secured from all the resources of the Valley. In that way, it will be better for all of us.

Cooper. Dr. Curtis, I think that you and Dr. McArdle have made a real contribution this morning and one that has been both interesting and stimulating.

Hutcheson. Mr. Chairman, as a visitor here today, and in the capacity of visitor, I listened with a great deal of interest to both of these talks. Mac's (Dr. McArdle's) idea of an inventory of resources, I thought was a fine thing. He left out one thing that I know he didn't intend to leave out. He said, "We should make an inventory of the vegetative resources and the water resources," and a lot of other things, but he left out human resources. As I sat here this morning and listened to the discussion of what we tried to do together in Haywood County, I wasn't satisfied with the consideration that we gave it. That was an experiment in procedure--human beings working

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Hutcheson. together. What Mac (Dr. McArdle) said here awhile ago was that we should do all these things, assemble all this information, and then each one of us apply his individual talents to bringing about the results desired. But I still think we have a lot to learn about working together, about a procedure for working together. We are all State and Federal agencies, we all get our money from taxation, and when we get down to the point where we compete with each other rather than cooperate with each other, it is a kind of slow procedure. I hope we will still study this problem of procedure and arrive at something that we, as agents, can use. We have got to work together for the good of the people.

Cooper. Thank you, Jack (Dr. Hutcheson), for that contribution.

Discussion of this topic is continued on p. 26.

LUNCHEON

The Conference recessed for lunch at 12:05 p.m. At the luncheon session, Chancellor John R. Hutcheson, Virginia Polytechnic Institute, addressed the Conference. Chancellor Hutcheson's statement appears in the appendix, p. 101.

The Conference reconvened at 1:55 p.m.

STATEMENT OF ASSISTANT SECRETARY
KNOX T. HUTCHINSON

Cooper. Needless to say, it is a real pleasure to have with us the Assistant Secretary of Agriculture. Secretary Hutchinson has spent the day with us and, apparently, has been interested in the meeting and what has gone on. Mr. Secretary, we certainly welcome you here. It is a great honor to a group of directors to have present with them one who can so well represent not only the farmer viewpoint, but also the viewpoint of our U. S. Department of Agriculture and the Congress and the Nation. We should appreciate it very much if you would discuss with us matters to which you feel we should have our attention called, or give us information as to how we may carry on to greater advantage, or any other matter which may appeal to you. I know that Assistant Secretary Hutchinson needs no introduction to an audience such as this, because, after all, this is his own home State. I guessthat most of these men, at least the younger men, have had many, many contacts with you. I am very happy to have you here; and I am glad to present Assistant Secretary Hutchinson.

Hutchinson. Thank you, Dean Cooper, for those very kind remarks. Above all, I appreciate most that I am a fellow Tennessean and a farmer; and it is in that interest that I find part of my

ASSISTANT SECRETARY KNOX T. HUTCHINSON

Hutchinson.

pleasure in visiting here today--the fact that I am a native Tennessean, my past has been in Tennessee, and my future is invested there; so it is a very great pleasure to be here. I have enjoyed listening to your program very much. It has been very helpful to me. I sat here this morning and made a pocketful of notes from Dr. Curtis' very fine speech; then at luncheon I heard another very fine speech. Before that one started, I had tried to create a kinship with the Chancellor, our names being almost the same. I don't know how much progress I made, but after that fine speech, I assured him that I was going to continue an effort in that direction. I like to establish a close friendship with that kind of a philosopher and great citizen.

I think your program here today is a very, very interesting one; and about all that I would like to say can be said in a very few words. If I do have to say something from the viewpoint of the Department of Agriculture, it is a great privilege that I can say it here among friends and people who have a very definite objective in which they share an equal interest. The report of the morning was interesting; however, there was part of it that I don't quite agree with in its general tone. That is in regard to the cooperation of the Department in some of our common efforts. I want to assure the group here in the Valley area that it is the intent of the Department to cooperate in every way possible with all of these programs through the agencies of the Department; and so far as was indicated by the Correlating Committee's report that the opportunity for cooperation was out and the door is closed, isn't true at all. I think I have said over and over that it shall continue to be the effort of the Department to cooperate in every way possible in these programs. I have been in the Department of Agriculture only a short while, a little more than a year. This particular problem became one of my responsibilities when I had been in the Department only a few weeks. In that work, we have constantly kept in mind the value of bringing the full benefit of all of the facilities that are available toward strengthening and improving our land-use program, by whatever agencies may be available. I think it is a challenge to all of us who have an interest in the land program in the Valley, and elsewhere, to find a way to make every facility serve the best interests of the land. We not only are thinking of organization, Dean, but we are also thinking of the results that we shall accomplish. As we meet here and elsewhere and discuss these problems, there is still the need out there at the land level. I am glad, in that connection, to say that the thinking in the Department has always been in the direction of the local people and the problems at the land level. But, moreover, we are emphasizing that we want to move, more definitely, the effort as close to the land as possible and as close to the people on that land. We truly believe that in cooperating closely with local people in

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Hutchinson.

carrying out any of these programs, whether it is that of the State, that of the Department, or that of the TVA, the local people should have a very definite responsibility for their share and full participation in those programs; so we are moving all of our programs as close to the land, and people on the land, as possible. I think it is a challenge to all of us that out there on the land, at the market place, and with the people on the land are the places where we are going to accomplish our real objectives. Just this thought again, as has already been indicated here today, that we are not only interested in the land and material things, but we are also interested in that crop of people that is growing on the land. We rather think that whatever our programs are in the future, for agriculture, that they must be closely tied to the right kind of people. I think that is TVA's interest, and I know it is to the interest of all sound thinking regarding our major agricultural program that to a very great extent the end results of any and all of our programs will be largely determined by the kind of people that are on the farm and are in charge of these programs at the level nearest to the farm.

It has been quite an inspiration, Dean, for me to be here, and I know that the thinking displayed here today will be a lot of help to some of the problems that I have. I always think this, that if I go out to meet with a group and I don't take back more than I bring, soon I will be operating in the red. I always try to take back more than I bring. Thank you very much.

Cooper.

Thank you, Mr. Secretary. I know I express for all our very great appreciation for your willingness to spend the day with us.

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DISCUSSION

(Continued from p. 24)

Cooper.

This noon, as we closed for lunch, there had been a very interesting paper presented by Dr. Curtis and an equally interesting discussion by Dr. McArdle. I don't know whether I am imposing on Dr. McArdle or not, but I have the feeling that there were some other things that he could say to us and that belonged to this general topic that had been up this morning. It may be that it is taking a little bit of advantage, Dr. McArdle, but I rather felt from the handful of notes that you had, that you had something more that was still coming. Won't you please give it to us?

McArdle.

Dean, there are some other things, but I would rather, if you

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- McArdle. don't mind, make my contribution as the talk goes around the table today and tomorrow. I believe I could be of more help that way.
- Cooper. You are not speaking of those definitely on the program; you are speaking of the group and you think it ought to have something to throw into the pot.
- McArdle. I didn't think that I was supposed to make a speech, but just to get some discussion started. I thought some of the things that I said would probably be disagreed to by others and might start some discussion. I thought that was your idea in having the three people listed for discussion. I may have been mistaken.
- Cooper. I had in mind three that would probably talk from a little different standpoint. President Brehm is to be in. It was the idea that he was to come on this afternoon.
- Jones. Dean, may I ask a question? What are the plans for keeping the tree-planting program?
- Baker. We expect to continue furnishing tree seedlings from the TVA nurseries, and the States are also increasing their nursery facilities.
- Jones. We had one of the finest tree-planting programs in the Valley. We had a million seedlings planted; and I think it is one of the outstanding accomplishments we have had in this type of work.
- McReynolds. Mr. Baker, isn't this the situation now? We have got more planting stock than we can currently get planted.
- Baker. No, I understand that our production of seedlings is just about equal to the demand.
- Jones. Don't let Tennessee have it all.
- Statement of Director Willis M. Baker
- Cooper. I am sure, Director Baker, that you have some comments on the relation of the Tennessee Valley to its streams and so on.
- Baker. Do you want my speech now?
- Cooper. No, I don't want your speech because we have got you down at the closing end.
- Baker. Then I have said about all that I have in mind other than that.

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Curtis. Dean Cooper, in line with what Mr. Baker said, as I understand the program, it would be quite appropriate for Mr. Baker to present what he has before President Brehm comes on. I was surprised that the thing was reversed. To my way of thinking, Mr. Baker can open up the subject at the present time and fit in well with President Brehm's contribution later.

Cooper. I am sure Mr. Baker's discussion would fit in very well here, provided he chooses to speak now.

President Brehm enters.

Cooper. President Brehm, do you know, you just got in in time. I not only have been taught to respect presidents, but to ask them before I tell them. We were just on the point of asking Mr. Baker to continue the discussion on the relation of the Tennessee Valley watershed to its streams. Would you mind if we let you come third on the program, which would mean following Mr. Baker? Would that be satisfactory to you?

Brehm. Dean, as you know, I have been listening to you for 40 years. And for 40 years in the past, I have been agreeable to deferring to your judgment.

Cooper. Thank you very much, President Brehm.

Director Baker's statement appears in the appendix, p. 107.

Cooper. Thank you, Mr. Baker.

Statement of President C. E. Brehm

President Brehm's statement appears in the appendix, p. 109.

Cooper. Thank you, President Brehm. President Brehm, as you know, has a way of his own; and I am always interested in what he brings up. I suspect that that also represents the viewpoint of most, if not all of you.

We have a session, as of course you know, that carries on tomorrow, but there have been a good many comments made today that have a very broad interest and that, I think, mean a great deal to the region. There have been interesting discussions.

We have with us today a number of people from the U. S. Department of Agriculture who have not previously met with the group. I am asking Mr. Dykes if he will present them.

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- Dykes. The biggest number of our delegation here (indicating Dr. McArdle) and the most important (indicating Assistant Secretary Hutchinson) have both been before you already. In addition, I'd like to introduce Mr. Ralph R. Will, Administrative Assistant to the Secretary of Agriculture, who is primarily responsible, with Mr. Hutchinson, for work on our water and land programs in the Department; and his close associate, one of the country's good hydrologists, Mr. Howard Cook. Mr. Paul V. Kepner, I believe most of you know, is assistant to M. L. Wilson, Director of the Extension Service. Mr. Lee Gaston, Assistant to the Chief of the Soil Conservation Service, is, of course, known to all members of the Conference.
- White. Mr. Chairman, could I take this opportunity to embarrass one of my coworkers? I want Charlie Young to stand up.
- Cooper. Dr. Curtis had a matter that he wanted to carry along at this particular time and present to us.
- Curtis. I only want to say a word at this juncture with reference to TVA's plans with respect to small watersheds. Mr. Baker has indicated that TVA plans to reorient our program somewhat geographically. There is no intent at all to go back on the test-demonstration farm program but to intensify it geographically and also to bring into the picture certain elements that have been lacking or that have not been fully developed in the program so far. We want to select a small number of trial watersheds, such as the Chestee. In this watershed, we have carried on surveys and measurements for the past five or six years. Here we have an adequate picture of the hydrology of the watershed, as indicated by rain gages, soil-moisture gages, and well gages. We have a fairly good picture of what the water yield is and what the water conditions are in this little watershed. We shall set up in this watershed, where we have had some test-demonstration farms, an intensive program, using the techniques we have already developed and several new ones. We shall confer with the various agencies that may be able to cooperate in that area and develop a plan which will involve not only the land and the forests, but will involve the communities and all the conditions that touch the communities. We shall study the economic situation, and social conditions, hoping eventually to evolve a sound program utilizing all the resources of the area. The program has been a little slow in getting underway and, in a sense, we have the cart ahead of the horse, in that we have set up an area demonstration with the University of Tennessee in Middle Creek, which is a part of Chestee basin, but that will become an integral part of the development. We want to bring to bear all the techniques and skills that have been developed in the test-demonstration program and in other programs. Eventually, we

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hope to determine, in that watershed, what progress can be made through the application of technology, through the application of the cooperative efforts of various Federal and State agencies, including the TVA, and of the people living in that area.

We have another problem that is tied in with the program, and that is the fertilizer plant at the Shoals. We were directed under the Act to take over the old nitrate plant there, to develop new and better fertilizers, and to test those fertilizers in cooperation with practical farmers. We have turned to the land-grant colleges, as you know, for that program. It has been a successful program; but war came along, World War II, and the plant was expanded at a much more rapid rate than we had planned originally. We came through World War II with a much larger plant on our hands. The shortage of foods after the war required continued operation of the plant on a very much larger scale than would have been necessary if the use of the plants had been limited to the development of new fertilizers and their testing, demonstration, and introduction into wide-scale use. We are faced with the problem of trying to get the plant again fitted into a meaningful program. TVA is not interested in the commercial manufacture of fertilizer. That is not a significant part of TVA's activity. We had to go into commercial sales for a time in order to keep the plant going while we were cooperating in developing new uses for the product consistent with the public interest in water and land use. This was particularly true of the nitrogen plant since the large-scale use of nitrogen for pasture and seed development had not been practiced. We would like to see the time come when the total output of the plant is flowing into channels that are meaningful in terms of the TVA's responsibilities for improving the use of fertilizers for public purposes. In the Tennessee Valley, where our joint cooperative program has had its effect and where, too, TVA has an intensified interest in the better use of its fertilizer products, we have progressed faster than elsewhere toward this objective. Plans for the Chestee watershed will involve use of fertilizers; and we shall be coming back to the land-grant colleges and other agencies for advice and aid, as we have in the past. We want to go as far as we can with the whole watershed as a unit.

While carrying forward a program in the Chestee basin, we shall, with your help, select several other watersheds, perhaps one in each State, in which we want to carry out a similar program. While we are getting the Chestee watershed into an action program, we expect to survey these other selected areas to determine the number of farms, size of farms, kinds of soil, slopes, the hydrology, and so on. Some information is already available. Up the road somewhere we shall have six or seven watersheds into which we are ready to move just as soon as we feel we can, on the basis of our Chestee experiments, develop a reasonable program. I wanted to state that

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what the TVA has in mind is an intensification, not an abandonment of the test-demonstration program at all, but an extension and intensification of efforts within certain geographic areas. In that, we hope to bring in the proper use of our fertilizers with respect to the Valley. Those are the things that we have in mind; and we shall be coming back to you to ask for help in working out the program, not only for the Chestee, but for the other watersheds.

Cooper.

Doctor, what is the area of the Chestee watershed?

Curtis.

The Chestee watershed is 85,000 acres. We want a watershed that is big enough so that it will be significant. After all, the Tennessee Valley watershed is made up of a lot of little watersheds, but we picked the Chestee as one in which to work out techniques, applying what we now know, and perhaps doing more skillfully some of the things that we have done in the past, getting more intensive records, and so on. Then we shall go into other watersheds where there are particularly difficult problems with respect to land use, water yield, and so on.

Hutcheson.

I should like to raise two questions there: one, what will be the effect of our present national emergency on the supply of phosphate? The second one is, whether you are having enough demonstrations, demonstration areas, under different conditions, to get effective procedure?

I have fooled with demonstrations all my life. I am a great believer in demonstration, whether it is on the individual farm, on the watershed, or wherever it might be, for its teaching value. I should like to give you this from experience. We knew 25 or 30 years ago that it paid to develop pastures, that you could do it with fertilization; and we tried to teach it by talks and bulletins and so forth. Then we got these individual farm demonstrations within walking distance of every farm. In the first 20 years, without demonstrations, we got about five percent of the farmers to top dress pastures; in the next 10 years, we got 75 percent, when they had demonstrations where they could see them. I know you can't put area demonstrations that thick. Yet, the first question is, will the fertilizer be available to do what you want to do, what is indicated; and the second is, whether your one demonstration to a State is enough to develop, really, a procedure and a technique?

Curtis.

In answer to your first question, I think there is no doubt that the demands of the defense program will cut into our ability to supply phosphate. Already, we are supplying phosphorus to the Army. During the last world war, we supplied 60 percent of all the phosphorus the Army used. We are trying to get the Army to say how much is needed, but no one knows. Our plant must supply phosphorus up to total plant

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capacity if the Army needs it. So far as we know, the Army will not need the total production of the plant. We have no indication that at any time in the future the total output of the plant will be needed, but whatever the Army needs, it must have. We think that there will be phosphate enough to carry on our program.

In reference to the second question, we have 6000 demonstration farms now, and we expect to have 6000 in 1952. We are making a survey of all of our test-demonstration farms now, the idea being that, as we set up the watershed programs, we shall include many of the test-demonstration farms already set up and to set up others. It will be another five years before the test-demonstration farms are concentrated almost entirely in selected areas. We shall have a transition period in which to fulfill our obligations with respect to the farms that are now on the program; but gradually we expect to concentrate the test-demonstration farms in the selected areas. In these selected areas, we may have area demonstrations. We are hoping to come to the place, however, where any farmer in a selected watershed who wants to be a test-demonstration farmer will have the opportunity of becoming such. I don't know that I have answered your question as to whether one area demonstration in a State will be enough.

Hutcheson.

I have this idea, Doctor, that we learn to work together by working together. It is better than any memorandum or agreement that we may draw up among ourselves. We learn to work together by working together, and as fast as facilities will permit. You may develop certain techniques for a certain area, and you may want entirely different techniques and procedures, maybe, in another area; and the question is whether you have enough demonstrations to demonstrate the effect of the total impact of all of these agencies on the problem of better rural life if you should stick to one to a State.

Curtis.

I can only say that TVA is going just as far as funds are made available for us to do it. We are fully committed to the program and want to carry it out. It is just a matter of how much funds we can get to carry it through. There is no change in our intention to carry on a test-demonstration program. The only thing is that during the next five years we hope to concentrate it in these selected areas.

Reaves.

Does that mean, Doctor, that at the end of five years, we won't have any test-demonstration farms except within your areas?

Curtis.

If you define areas broadly enough, yes. I think all the area demonstrations will be within selected watersheds. There may be special situations where we shall need to have test demonstration farms in order to have a logical program.

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White.

Dr. Curtis, I think you might also state that our present thinking is to the effect that we will have a limited number of test-demonstration farms distributed well over the Valley, chiefly for farm testing of new or improved TVA fertilizers. We are thinking now of some 500 or 600 such farms in the Valley, and these will be located so as to include important soil and agricultural conditions irrespective of tributary watershed areas. We are also thinking now of having a limited number of such farms in the non-Valley parts of the Valley States and also in the non-Valley States in which test-demonstration work is being carried on. It might be added also that we are contemplating selecting what might be called critical agricultural areas which may or may not conform to watersheds. In each one of these critical areas we are now thinking of establishing somewhere in the neighborhood of 200 test-demonstration farms. The chief function of these farms will be agricultural development.

Hutcheson.

I am not so much concerned with doing away with the unit farm demonstration as I am in having this larger watershed demonstration with land, people, and water on a broad enough scale so that the people of an area can't say, with regard to results in a watershed, well, they have particular conditions. That is what they used to say about individual farm demonstrations, they have particular conditions, and TVA is doing this thing for them, and that. If they can't see it, they are not convinced. If what they have to do is close enough to them, it teaches much more rapidly than some place in Tennessee that I might tell our people about.

Curtis.

I might say this, Chancellor Hutcheson, that the test-demonstration program is yours, after all. TVA is helping as it can. TVA will continue to help as it can. I am hoping that we will continue to be able to supply the phosphate, barring a great national war or anything of that kind. I am hoping that we shall be able to supply phosphate for part of that program. It will depend, of course, upon funds we can get from Congress for that purpose, but I visualize that you folks will want to carry on.

Hutcheson.

I am not talking about the amount of phosphate. I am talking about this cooperative effort within areas that will be thick enough really to teach, locally. Maybe, personnel is what we need more than phosphate. It could come to that. Our farmers now practically all buy phosphates and other fertilizers to fertilize pastures. Not all in this area, but maybe nine out of ten of them. I am thinking about the larger idea of what we are trying to develop, not the phosphate.

Curtis.

I don't think we can see very far into the future. We are going to start with the test demonstration in the Chestnut basin and later move onto the other watershed, so that we

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Curtis. shall have several of them going in the next few years. Beyond that, we shall go as far as conditions warrant and as far as we get money to go.

Young.
(H. N.) May I ask a question, too, about those watersheds? You say you are going to select about seven. They are going to be selected specifically in such a way that they are going to represent a cross section of the entire Valley? They will sample the various climatic belts, the various soil belts, for example?

Curtis. The selection of these watersheds will be in cooperation with the people of the States.

Young.
(H. N.) You want something that will give you an answer which can be applied as nearly universally as possible over the area, is that right?

Curtis. That is right.

Young.
(H. N.) After we select a sample watershed, then it will be our further business to select sample farms that are within the watershed that will be representative of the watershed.

Curtis. That, again, is a problem that is going to come back to you folks. What should we do? When it comes to the program, we are coming back to you folks.

Young.
(H. N.) I maintain that if you are going to get value out of this, value of such a nature that we can apply it across the board, we are going to have to do the sampling more or less scientifically and not on a political basis.

Curtis. I think that is right. On the other hand, I don't think that TVA would want to have all the selected watersheds in Tennessee, say.

Young.
(H. N.) I am not talking about that kind of basis at all. Very often we find somebody out there, and we say: Well, he's a nice fellow, he could keep those records; and then somebody else: Well, he needs something like that on his place. That is the kind of basis I am talking about.

Curtis. We are hoping to select the watersheds so as to get the most information out of them. We want to select them so that they will be representative and the program can be extended to other watersheds.

Young.
(H. N.) If you go the entire length of the river, you will probably have a pretty good sample of the various elevations, a pretty good sample of the various climatic belts, and a pretty good sample of the various soil belts.

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Curtis.

I was impressed with a visit I made in Washington County a few weeks ago. The thing that struck me as I looked around was the relatively small amount of money that TVA had spent there in the form of fertilizer. It wasn't a drop in the bucket; it was completely lost in the total development. I thought, if we have supplied anything up here, it has been only the initial incentive. As you look at the situation now, the part that TVA has put in is infinitesimal. Of course, that is true of a good many of our programs in the Valley. What is now being done by the Valley States in forestry, in recreation, in public health problems, etc., is much greater than the TVA's contribution. We are happy to think that we may have been instrumental in getting the States and other agencies to go ahead with Valley programs. If the TVA can play that role in the Valley, it will be the best use we can make of our resources.

Young.
(H. N.)

I take it, then, that in these various watersheds, we are going to put on a research program along with a demonstration program, and we are going to try to get a balanced use of the resources on a continuing basis. Is that about the aim of this?

Curtis.

Yes. The aim is to get the best use of all of the resources.

Will.

Mr. Chairman, referring to the matter that Dr. Curtis and others are delineating here, I'd just like to make a few observations about how it appears the Department of Agriculture program and agencies might fit into all this.

First of all, I think the Department would be wholeheartedly in sympathy with this kind of approach; this orientation of the efforts in some fashion to the requirements of the watershed, with particular reference to the basic resources, land and water. I am thinking also of the very close relationship of what goes on in the watersheds to the character of the stream flow; the problem of the streams. It seems, from what I get out of this proposal, that we can certainly continue with our so-called going programs in the entire Basin area. We don't want to neglect what we have started; we don't want to neglect any part of what we have started in the entire watershed. In addition to that, or as a part of that, we want to, on the watersheds, point these efforts and intensify these efforts to the particular farms of those watershed areas.

If the concept I have in mind is correct, I would say further I think the Department of Agriculture agencies can make a very real contribution in that fashion, thinking in terms of the various authorities and various programs under which the Department's contributions are made. As you well know, they are quite extensive and varied, but they are intended in every

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Will.

case to reach the local areas and watersheds and people, and to help people do the actual work required. One of our administrative problems--I suppose you would call it that--is the process of getting our programs and our efforts geared in to the requirements of the watersheds; getting the proper degree of intensity, proper degree of balance, and the proper timing so that our efforts are really effective in these particular project areas.

As you gentlemen know, our Department of Agriculture programs for the most part operate in a Nation-wide way, that is, they are set up by categories of functions on a Nation-wide basis. Of course, they are flexible and adaptable--they are adaptable, actually, to the particular requirements of regions, States, and agricultural communities--but when you get to this watershed work, we have found that there is usually required an additional degree of adaptation and intensification. Among our different programs and authorities, we have, as you know, certain work under the flood control acts, dating back to about 1936, and under that program we do have the authority to plan and adapt our activities to the needs of a particular watershed. That authority and program is unique among all of our programs in that its very nature, going back to the basic law, is pointed to project areas or watersheds, so to speak.

As we proceed, Dean Cooper, in this work, we have found that so far as our program is concerned, there is considerable virtue in planning and setting up watershed programs sometimes on a subwatershed basis and sometimes on a rather wide basis, and then going to the Congress with a program and a plan for that particular watershed or basin and getting an authorization which then becomes the basis for securing appropriations--the proceeds of which then result in administrative resources, such as personnel, and other types of program resources--which can be funnelled into and point toward the particular problems on the watershed. In other words, once authorized, these programs, in effect, become the basic law itself under which the Department of Agriculture can operate effectively with respect to the problems of that watershed.

What I have just said applies in a very general fashion to all of our programs, as the requirements might appear; such programs as technical service under the Soil Conservation Service and even agricultural credit. There are certain types of agricultural credit which will fit in and augment the program, and that can be adapted under this administrative plan I mentioned. Also, the educational programs of the Extension Service, and the ACP and PMA programs, can be tied in. I am speaking primarily as to how the Department of Agriculture programs can be made more effective in this great cooperative area which we are discussing here today.

I just throw that out as a suggestion.

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Will.

I believe some type of effort such as I just mentioned here by the Department of Agriculture would fit into what the TVA and all of us are talking about here, as Dr. Curtis has mentioned, starting first in the Chestee watershed, and then proceeding according to a time schedule in the other watersheds. It seems to me it would be of very considerable value to have an idea as to what we are aiming at for the entire Tennessee Basin, so that within a reasonable time we can come out with a program for the entire Basin; thinking, again, in terms of what the Department of Agriculture might be able to contribute.

Just another thought, and that is that no matter how we go about this, no matter how the Department of Agriculture and others may make their contribution (and we will all find ourselves--TVA, agricultural colleges, universities, and perhaps other agencies in the State--throwing in our various resources and contributions) we have, it seems to me, the problem of setting up a working mechanism. Probably it isn't too difficult, but something has to be done to develop some mechanism--a committee system, or something of that kind--through which we can work; some kind of a central control, so to speak, in which we all participate. Perhaps TVA might furnish it, I don't know, but then there is the Correlating Committee here that exists now. It or some adaptation or modification of it might constitute that mechanism. I might say that in some of the other basins where the Department of Agriculture has been making contributions of this kind, we have established mechanisms, called the USDA Field Committee. These Field Committees have the job of pulling together, coordinating and directing the planning and other efforts of the Department of Agriculture. These Field Committees fit into the mechanism of the interagency basin committees.

At this point, Dean Cooper, I just wanted to make these observations, not, certainly, with any degree of finality or mature judgment, but just to throw them into the hopper here for consideration and perhaps discussion.

Cooper.

Thank you, Mr. Will.

Young.
(H. N.)

Dean, I just want to ask one specific question. Suppose we selected a portion of the Valley. Suppose we set up our general objectives and set up a number or list of problems which we thought might be necessary to solve in order to attain that general objective. Suppose we found out that one of those problems involved research on the hydrologic aspects, research on hydrology. We have on our staff a Soil Conservation man, full time. The question I want to ask you, Mr. Will, and Dean Cooper, both: (That is not a Soil Conservation area, not a Soil Conservation district, not organized as a Soil Conservation district) Is it probable or possible that we can employ

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Young.
(H. N.) on a cooperative basis, somebody whose services are financed by the Department as a whole or the Soil Conservation Service, to do research on hydrology in the Tennessee Valley?

Will. Perhaps I had better pass that along to Jimmy Dykes. I would throw in this comment: that aside from the Soil Conservation district program--speaking especially in terms of watershed programs--that under the Flood Control Acts which I mentioned a few minutes ago, it is possible to secure watershed planning funds which would result in special personnel to study the problems and factors of the various watersheds, collection of data, maybe even some types of research--I am not sure about that--certainly to study the problems on the watershed. That survey study then becomes a special part of the Department's work that is carried on through the Soil Conservation Service and the Forest Service. Those are the action agencies under which it operates. That type of effort, I think, would fit in very, very fine with this program which you have projected here for the watershed of the Tennessee.

Dykes. As I understood Dr. Young's question, it involves research on hydrology. Is that correct, Doctor?

Young.
(H. N.) Yes.

Dykes. Our research program is not organized on a district basis at all, but on a national basis. The fact that we have most of our research in areas where districts are operating comes about because of the numerous demands for specific types of information from these areas. Therefore, we are spending very little of our research funds outside the areas where districts are now operating. But there is nothing to prevent our cooperating on such projects, certainly on flood control surveys, as Mr. Will has pointed out. We survey the entire area of the watershed to determine the problems in the survey stage. This work is done under authorizations that are entirely different from those under which we assist Soil Conservation districts.

Young.
(H. N.) What you are saying then is that the Soil Conservation Service is playing on the team when it comes to research?

Dykes. Yes.

Young.
(H. N.) That is the answer I wanted to know.

Dykes. When we get the solution and start to apply it widespread, that is a different proposition.

Shoffner. Mr. Chairman, I should like to raise this question which was asked about Dr. Curtis' question awhile ago. The question was

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Shoffner. asked over here whether these individual unit farms would be dropped eventually, and we would all go to the watershed basis. I should like to say this about that. You said that would probably depend upon funds available. My understanding, at the present time, is that they will be continued until their time expires, which may be four or it may be eight years, whatever time they were set up on. It has been my observation, since 1935, like some of you people who work on these programs, that when you take the unit farm away from this program, you are taking one of the fundamentals away from the program. That's absolutely essential to keep the area demonstrations alive and going. I think the area demonstration is excellent to reach a large number of people and spread the influence. I think that is a good way to do that. I approve of that very thoroughly, but whenever you fail to try to get it back to unit farms, then the first thing you know you are getting away from the grass roots of this thing, I am afraid. Therefore, we have held to the grass roots. I don't think we need as many unit farms as we have had, probably, but I'd like to see us think in terms of keeping some of these unit farms in this program to guide us in the watershed programs. I think they are essential.

Curtis. These unit farms, of course, are under the supervision and setup and are chosen and operated under land-grant college people, not TVA.

Shoffner. No, they aren't TVA; neither will the watershed be TVA, either. I think it is cooperative. I was talking about the cooperative program, when I was speaking of that.

Curtis. TVA is going just as far in supporting this program as it possibly can. A majority of our farms are selected with respect to certain watershed areas. We are not planning to go back on that program at all. The only thing is that in contributing the support that TVA can give, we are hoping to concentrate more in the areas that our greatest concern is with. What the land-grant colleges choose to do with their test-demonstration farms is up to them. TVA will continue to lend support to the land-grant college program to the best of our ability.

Will. Mr. Chairman, if I may speak on that question. It seems to me that it is very important that the so-called "going" programs should not be allowed to deteriorate in any way at all. Unit test-demonstration farms are certainly an asset where other kinds of programs are operating on these farms in these agricultural communities. It seems to me that whatever is done to meet the needs of this particular watershed should be designed with a view of not interfering with the schedule of a going program. Also, it would seem that in developing the

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watershed programs and in implementing them, we should rely on the assets that exist in these going programs; and as we plan and carry out such watershed programs, they are going to have to be carried out through the people, just like we have always done. The land is still in private ownership to a large degree; and the public programs are going to have to operate with and through and in support of the primary efforts of the people who own the land. In doing that, it seems to me, we could definitely plan to utilize these techniques, educational and otherwise, that have been developed. The only departure, it seems to me, is to point up the problems of the particular watershed, and, in an intensive way, study those problems, identify the development potential with the people, set up objectives on a watershed basis; and then as we proceed to implement a program to achieve those objectives, we could certainly use these tested techniques that have been developed in that whole process. Certainly the test-demonstration farm would have an important place. It seems to me that other standard programs and techniques we have would also enter in; incentives of the ACP, the technical service of the SCS, all those things that fit together and reach the farm in the agricultural communities in support of the people's efforts. I don't think we want to turn these activities upside down at all, but to adapt and use whatever we can in a going program.

Curtis.

There's a tendency, when I speak of what the TVA expects to do, to confuse that with the test-demonstration farm program. You come to a point where the TVA is important to the test-demonstration program, and it is a relatively small part of what is going on. The only change, so far as TVA is concerned, is where the TVA concentrates its particular support of the test-demonstration program. We think we can do best, with the small amount of money that we have, to concentrate in those areas which are of particular concern to us from the standpoint of watershed protection, stream flow, and so on. I am hoping that the number of test-demonstration farms will continue to be large. I expect that the number of test-demonstration farms that TVA will help to support will be larger in the future than at the present time. It is not a matter of eliminating the test-demonstration program at all. It is merely a matter of changing somewhat geographically the TVA support of the program.

Cummings.

Dr. Curtis, awhile ago you mentioned the fact that you were working toward utilization of the output of the fertilizer plant entirely in programs which are meaningful in these watersheds. I wonder if you would care to elaborate on that just a little bit further.

Curtis.

I am not very sure that I can elaborate on that, because I am not sure what the meaningful programs are. We do not consider it meaningful for the TVA to operate the fertilizer plant just

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- Curtis. as a commercial operation. We want to get back to the place where the TVA fertilizer output will be earmarked for special uses rather than be thrown on the open market.
- Cummings. What technique would you use for determining the uses for which that should be earmarked?
- Curtis. Whatever you people think is the right thing to do. Again, that is up to you. Here we have the Government producing fertilizer. TVA is producing fertilizer. Now, the TVA is interested in carrying out a program here in the Valley. We are looking to you folks to advise the best way in which to use that product in carrying out a meaningful program in the Valley.
- Cummings. I was just wondering about a procedure for getting our suggestions incorporated into the policy on allocation of those materials for specific uses.
- Curtis. What we are trying to get away from is the TVA operating a commercial fertilizer plant and selling the products in the open market. We want to use the fertilizer plant as one of the tools by which we can bring about in the Valley what might be considered to be desirable changes in land use. TVA has a stake in those changes. TVA is interested in agriculture as such; so are PMA, the Soil Conservation Service, the land-grant colleges, and a lot of other people. TVA has, also, a rather unique position in respect to the flow of water in streams to generate electric power, etc. Now, we should like to get our fertilizer used for those purposes in the Valley which will accomplish, in the judgment of you folks and others, the greatest benefit in the Valley. I am not sure that I have answered your question. What did you have in mind, Director Cummings?
- Cummings. I missed the application to the question which I asked. I still am not much clearer, I believe, on the techniques for getting this thing across here.
- Cooper. Dr. Curtis, in listening to you discuss this, you are using the same language, approximately, as I remember it, that was used when TVA first started and came to the various States, asking the State institutions to determine the use which they wished to make of phosphate. Isn't that the same thing that you are talking now?
- Curtis. We are making more of it, and we have a larger plant.
- Cooper. Your general viewpoint, as I hear you express it now, is just about the same as you expressed it previously.
- Curtis. We came out of World War II with a plant that no longer fitted the program that we had. Now, we were compelled, because of

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- Curtis. the food situation, the land and fertilizer, and so on, we were compelled to operate that plant down there more or less according to national policy and to distribute our products more or less in the open market. We never liked that program. We want to get back to what we had in the beginning, using that plant to carry out here in the Valley the programs which you people formulate. That is what we are after.
- Young.
(H. N.) What you are doing is using the fertilizer as a kind of persuader. Is that right?
- Curtis. Persuader, if that is what you want to call it, but as a tool to accomplish needed land-use adjustments would be my way of stating it.
- Cooper. It seems to me that the processes, or arrangements, which TVA made with the several States represented a fine opportunity for our agricultural colleges and experiment stations to join in the beginnings of what have become a very great program. It seems to me that you gave us a wonderful basis for cooperation.
- Curtis. Among the things which TVA has been engaged in, I think the test-demonstration program has been one of the most important. I certainly should hate to see anything done that would halt, or injure, or confine that program. I think it is a great program. But there comes the question now of where TVA should concentrate the help it can give. We are asking, and have been right along, ways and means of using the fertilizer plant in a meaningful way, which, of course, means fitting into a program in the Valley. We have already taken steps of one kind or another to that end. PMA is cooperating with us in getting all the nitrate out, 25,000 tons that we have set aside for special use. We have reduced the price on it, and PMA is handling the mechanics of getting that stuff out.
- Hutcheson. Dr. Curtis, it seems to me that the question that Dr. Cummings has in mind is this. We here today are trying to raise our sights and go on to greater things. We have expressed reasonable satisfaction with what we have done in the past. As we go into larger fields, meaningful uses of fertilizer, I believe is the term you used, it seems that you are saying to us at the colleges, "I am expecting you at the colleges, who have done more research than anybody else, to come to us and tell us what is the most meaningful use of the fertilizer that we produce." The procedure that you are after is how we (the TVA) and they (the Colleges) can get together to pool our brains on this particular problem. Is that right? It seems we haven't pooled our brains on that sort of thing. It seems to me it is up to research and extension people to develop a procedure with the TVA for doing that very thing, if you already haven't.
- Bass. I might add that a great deal of progress has been made toward such a procedure through our contractual arrangements with the

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Bass.

distributor of our material. The contracts with the distributors of our material provide that the cooperative and the college will sit down together and agree on a program of desirable uses, such as for grass and pasture production, and that material will be made available to farmers for those desirable uses in preference to other purchasers. The remnant over and above the amount which the farmers purchase for these preferential uses is then sold without restrictions as to use. We would be much happier, as Dr. Curtis pointed out, if all of the TVA produced materials could be fitted into the educational program jointly developed by the cooperatives and the colleges; and our objective is to fit it all into desirable uses for public program objectives. The policing of it is left to the seller, generally a cooperative, to be sure that the farmers to whom they furnish the fertilizer will use it in accordance with the agreement. In addition to giving preference to the purchasers of our material for use on pastures and grasses, last summer we offered a special incentive as seasonal discount on ammonium nitrate to farmers in the Tennessee Valley for the production of grass seed and winter cover.

Cummings.

The special incentive on that was directed to achievement of an objective that you specified. When the land-grant colleges and cooperatives get together on "meaningful uses," will the special incentive include an additional requirement that uses must be within the framework of what the cooperative and the institution agree on, plus what you specify as desirable? They both have to harmonize on that point.

Bass.

Mr. White might want to add something to my comment.

White.

I think that the link you are feeling for is the link that naturally comes out of the beginning of a thing that is not developing as rapidly as you would like to see it. For instance, we have attempted to distribute our fertilizer for the uses, as best we could determine from our consultation with the colleges, that would aid in bringing about desirable agricultural adjustments. At first, TVA tried to be the policeman on that thing, and we found that was a complete failure. Now, then, our experience suggested one common-sense step for us to take, namely, rely on the cooperatives for the responsibility for proper use of the materials. That very thing is what Dr. Curtis is talking about, getting up to the point where there is a complete working arrangement between the coop and the college, where they have worked out these best uses. Those steps have not been completed in all of the States; I must say that very frankly. In several States the coops and extension people have sat down and talked about these things and have worked out sound programs for the use of TVA fertilizers in our educational program. We believe that the uses that TVA

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White.

are vitally interested in are the same uses that the colleges are vitally interested in. I wouldn't want to admit at all that TVA is going to put on certain restrictions and the colleges and coops put on other restrictions, not at all, because there is bound to be one best program of agricultural development in this Valley. It is going to take a long time before we get these four teams--and that is the coop, PMA, the land-grant colleges, and TVA. We have not got that team organized to the point where we can grind out the kind of grist that the farmer wants. That is going to take time. I think we have all got to be patient about it, but--I want to illustrate it this way--this winter pasture program that has been carried on in the Valley this past fall--and we know that it hasn't been in your State--has been very effective in some other states. The program didn't just spring full-bloom from the ideas of TVA at all. It came right up with this whole grass-roots development out of a small beginning; and the TVA was so interested the Board of Directors were so interested and so pleased with the results of a small beginning that they said, now this looks too good to pass up and in order that we might go on more rapidly, we want to make a special-inducement price in order to get this job done. Now, all of these cogs haven't altogether meshed, but I think we can look forward to a time when they will mesh. PMA is not doing the best job that it expects to do of getting this material on winter cover. We are looking forward to getting some reports that will indicate what has been done, how it has been done. The cooperatives have been pretty diligent in seeing that this material has been put out where the specification called for. Now, it is true we passed out these specifications, but these specifications didn't spring from our brain. The specifications came from the experiences that we have had with the States who started to use it in a small way a few years ago. I don't think there are two questions at all; I think there is one.

Cummings.

I think you may have misinterpreted what I was trying to get at, Mr. White. I was trying to find this link for transfer of our ideas to TVA so that we could get together. As I understand it, your proposal for transfer of our ideas for best uses, for meaningful programs, is through the educational programs which the cooperative and the land-grant college develop jointly.

White.

That is correct.

Cummings.

That is transmitted by the cooperative, not by the land-grant college, to the associated cooperatives which, in turn, gets it back to TVA. Is that correct?

White.

I don't know. That has been done as perhaps the shortest cut to getting something started, but the most effective part of this work has been where the land-grant college people and the coops sit down, and they do not stop there. Some of them came

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White.

right on to TVA and sat down and worked this thing out with TVA, or we have gone to the institutions and worked it out with the institutions. It is a pretty poor arrangement, particularly this project Mr. Bass talked about. We did everything we could in a short space of time to get as much of our material used in educational programs as we could, but it hasn't been a perfect job.

Cummings.

I still am not quite clear about how we go about setting down our thinking and TVA's thinking together on this thing. I thought from what Mr. Bass said that we work out this program between the college and the cooperatives and through that contractual arrangement, our ideas are transmitted. I believe you say that is not it. Now, what is it?

White.

Out of the experiences that we have had with the institutions, we have drawn certain conclusions. We think they are sound conclusions. Those conclusions, which came not from the coops, but came from the colleges to TVA, have been transmitted by contract relations with the cooperative; and perhaps the link that you are talking about is not so much the college and the TVA getting together, but more a lack of the college and coop getting together. It comes of the circuit through the college, then to us by contact with the cooperatives. Not all of the aspects of the program would be of concern to the TVA, but the things in which we are particularly interested. We found out very definitely that these winter pastures were of growing concern.

Cummings.

Let's not just think about these winter pastures. That is one aspect of the whole thing. I want the general principle.

White.

We haven't spent as much time on these particular things as we should have spent. Generalities might be worked out by the committees of this Conference. Then we could begin to get into the details of this by working with the individual institutions. Our people go to the institutions and we try to fit our program interests in with the actual workings of the institution. That is a continuing process and has been for years.

Cummings.

If that is the process, then I should like to see this forum consider problems of that sort.

White.

There are three committees set up now that are amply capable of handling these problems and presenting a report.

Hutcheson.

What are the three committees now?

Clayton.

Committee on Water and Land Use, Committee on Rural Facilities, Services and Industry, and Committee on Plant Facilities and Products.

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Hutcheson. The question which I tried to raise there at noon is this, whether we in the land-grant colleges in research and extension, from the standpoint of administration, have been active enough and have given enough time to this thing in proportion to its importance. We never like to talk about our own faults, but it seems to me that this thing is vital enough to justify more time on our part. Maybe there is one of these subcommittees that can work on this particular problem of meaningful uses of the fertilizer.

Cummings. I suppose the Committee on Plant Facilities and Products would be the logical one to bring such suggestions before this Conference, but I do not believe that anything has been brought to this Conference from that committee as yet, has there?

White. I think that committee is just beginning to function.

Cummings. I know the history of that change in those committees, and I know that it is relatively recent that the committees have been reoriented. I recognize that. The thing that I wasn't quite clear on is the procedure that we would follow as that committee brings in reports and recommendations for debate in this Conference.

White. I don't think that I can answer that question. I think this Conference is the place where things like that should be resolved.

Hutcheson. We never get time to go into the guts of this thing.

Bass. The Committee on Plant Facilities is authorized to study how these materials which TVA can produce in its plant can best be fit into to achieve the desirable objectives of the regional program. My answer would be yes, that that committee would be the proper forum.

Cummings. I should like to suggest that at the next meeting of this Valley-States Conference we ask that committee to bring in something as a suggestion for discussion.

Cooper. The members of the Committee on Plant Facilities and Products are as follows: C. H. Young, Chairman, Walter S. Brown, R. W. Cummings, and Roland Crumpler.

Clayton. That list is out of date. Someone was appointed to succeed Dr. Cummings, whose term expired, as I reported this morning.

Cooper. Dr. Randall Jones has been appointed to succeed Dr. Cummings. Otherwise, the committee is just the same as it was before.

White. He is leaving the Valley.

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Hutcheson. The easiest thing in the world, under the American system, when you can't solve anything, is to set up a committee. It seems to me the thing to do from the land-grant college standpoint is for these committees to sit down with the TVA, determine what are their joint responsibilities, how they are going to proceed, and take time.

Cummings. I should say this that I attended one committee meeting, but I do not believe that it is quite clear to any of the committee members there that that was exactly their assignment or exactly what their assignment was. We did a little exploratory job to try to determine what the assignment should be, but it certainly wasn't clear to me, at least, and I don't believe it was clear to the committee, Mr. Clayton, that that specifically was an assignment to the committee.

Clayton. I think this could be said about these committees. It was recognized to start with that we couldn't have a large number of committees and, therefore, we would have to spread the wings of these three committees pretty wide in order to route to them subjects that were of current interest and that were pertinent. How does that routing take place? I think discussion here points very clearly to the fact that it will take place when and to the extent that the administrative officials concerned with these matters utilize these committees for reacting to these problems that are of mutual interest to members of this Conference. If then, today, we think it would be helpful for this Committee on Plant Facilities and Products to take up this question which Dr. Cummings has raised here, and through contacts with the agencies here represented, try to bring in some proposals and suggestions at the next meeting, quite obviously that is what the committee is there for. That is the question that is raised here. Is it the desire of the Conference for the committee to proceed in that way? If so, we will try to get it done. That is the real object of these committees, to think through and work through these matters and then bring concrete suggestions before the Conference which we can discuss and on which we can act. I think it would be a very useful and helpful thing for this committee to attack that problem.

Hutcheson. For years and years we criticized the U. S. Department of Agriculture for going ahead without consulting people in the States, or consulting us, specifically; and we are getting to the same point with TVA. We are getting around to the point where we would just as soon make the mechanism work. People on the farms in the Valley feel that those darned college people are too slow, we will just have to plow up something ourselves. And it would be perfectly logical and human for the TVA to think the same thing, that they are too slow and we'll have to start this thing. I think that is our responsibility.

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Young. I would just like to think out loud a little bit. Maybe I am talking out of turn, but it seems to me we haven't had a clear-cut idea of what our responsibilities were, first; secondly, we haven't had a clear-cut idea of division of responsibilities; third, we haven't had a clear-cut idea of whether we had the authority to carry out our responsibilities.

Clayton. Are you speaking of the committees, Dr. Young?

Young. I am speaking of everybody.

Cooper. The committees--just to be accurate--the committees have really spent quite a lot of time on these various jobs in the past year.

Young. Have we outlined our problems definitely?

Cooper. Who do you mean by "we"?

Young. Whoever has been doing the job. I haven't done very much on it.

Cooper. I recollect, at least I think I recollect, that the committees are doing some very good jobs; at least, here is their record. Whether they have got any farther than the record, I do not know.

Young. I can't get a job done well unless I see it outlined on paper, with the objectives, and procedures, and the division of responsibility, and a statement of who is going to do what.

Clayton. There was a statement adopted as to the functions of each committee that has been set up. Personally, I don't think such statements amount to much since they must be broad enough to embrace all the subjects that the committees might concern themselves with. The thing that seems to me to be important is to tell, at a given moment, what is worth while for those committees to concern themselves with. One suggestion was made right here today, Dr. Young: Would it be useful for this Committee on Plant Facilities to take up, between now and the next meeting of the Conference, the matter brought up by Dr. Cummings, and come in here with definite proposals and suggestions on it? If so, it is perfectly within the framework of the committee's responsibility. There is no question about that. The only question is whether, administratively, it is considered to be a useful procedure to explore the matter through that channel.

Cummings. It rather seems to me that if this committee could accept as its assignment, or one of its assignments, a review of the products that are being produced in TVA plants--and that has already been done in part--together with those purposes to which

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Cummings. major attention in the distribution of those products within the Valley should be directed, and bring some suggestions along that line to this Conference for discussion, that that committee could fulfill a very useful function to the Conference and to the Valley region. I should like to suggest that we request them to undertake to bring before the next Conference some suggestions along that line. I make that in the form of a motion.

Murray. I second the motion.

Cooper. You have heard the motion, or the purport of the motion, which has been made and seconded that there will be brought before this group at the next meeting, which is April 11, a regular assignment to this particular committee. Is there any discussion on it?

McAmis. Mr. Chairman, as I understand the functions as they have so far been defined, I think this question more properly belongs in another committee. We are considering things that are more in line with what I think we have in mind for the Committee on Water and Land Use. That is the committee which should consider this kind of question.

Cummings. What would the Plant Facilities Committee be designed for then, Mr. McAmis?

Clayton. One of the first questions, you remember, Dr. Cummings, that came up was whether in the matter of plant facilities, nurseries as well as the facilities at the Shoals were covered by this committee, and the understanding was that they both were included. However, it was not only a question of the plants we have, but also the use made of those plants, the output of those plants, their products, and so on. I can't see any point to that unless the questions are considered by the committee with reference to using plant products for the purposes and ends we have in mind. We haven't found any way to draw a sharp line between the committees; so that at some point the functions of one committee will overlap with the functions of another committee. We reach a point here on this Committee on Plant Facilities and Products when some of the problems of that committee will necessarily involve matters that are also the concern of this Committee on Water and Land Use. So it seems to me there should be some correlation of findings between those committee, perhaps looking to the Committee on Water and Land Use for a considerable amount of information and suggestions as to the ends to which these products are to be used, and then to the Committee on Plant Facilities and Products for consideration of the feasibility of turning those particular products out in the quantities and in the time that they may be needed for the purposes that we have in mind. Those two things work together. There is a

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Clayton.

question of adjusting the means to the end which may involve consultation between the two committees. I suppose that will tend to confuse us just so much more. Still that is the true situation. There is an interrelationship there.

Young.
(C. H.)

Cap (Mr. Clayton), I happen to be the chairman of this committee you are talking about. I was just wondering whether the real question you are trying to ask is how that material should be used or distributed after it is made, rather than how we make it in the plant facilities. I kind of agree with Mac (Mr. McAmis). There is some question in my mind whether our committee is the best to handle that question of coordination of use, or whether that question might best be handled by one of the other committees.

Clayton.

Still the question does arise, does it not, Charlie (Mr. Young), as to the feasibility of producing materials needed in quantities and on a time schedule, and at costs, to fit the needs of a program? Might that not very well come up?

Curtis.

After all, we have a plant down there in which we are developing various products, primarily to develop better processes, rather than to use the actual fertilizer. If we haven't found a good process, we carry it up through various phases. We have the ammonia plant down there, using a quantity of ammonia, fixed within limits. How should that ammonium nitrate that we are producing down there be used meaningfully in the Valley program? We also have electric furnaces turning out superphosphate and metaphosphate. Now we are going to have a new one. How should those products which will be turned out in those plants already existing best be used in the Valley program? It doesn't seem to me that the Committee on Plant Facilities and Products is concerned with that, because how best to use those products which are going to be produced down there which are now going practically in commercial markets--that involves the whole agricultural program without a doubt. It seems to me you ought to have that problem handled by the committee which is concerned with land and water use in the Valley.

Now, we have another problem coming up. Of course, with some of these products that we are developing, we are coming to the place, if we are going to carry this thing through the pilot plant stage, when we want to come to you again to test and use them in this kind of project. We are going to make, for instance, next year, 12-12-12 fertilizer. Now, where will that fit into the Valley program? That doesn't involve the question of plant. We have the plant down there producing and we have this new plant, but it is a question now of how best to use the products of the plant in the Valley program in a meaningful way to carry out these objectives that we have in the Valley and that fit into this program of land and water use.

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Cummings. I think that is right. But I am still a little confused as to just what assignment, what job, the Committee on Plant Facilities and Products would have unless it had some concern with the utilization of those products.

Curtis. So far as I am concerned, I did not have anything to do with the formation of these committees at all, but it looks to me, as regards this factual information, that we have certain plants down there producing so much of this, that, and the other.

Cummings. This committee is just to receive information on what you have. Is that correct?

Curtis. That is the situation that we have down there; certain plants that have certain producing capacities. We have other processes coming along to a place where we will have plants producing different products. So far as TVA is concerned, we should like to invite--as we have always asked the land-grant college people--to tell us how best to fit those fertilizers into a meaningful program. I don't know about the committee setup, but that is the problem. It is a problem that was presented to the land-grant colleges in the beginning. We had a certain plant down there. What should we do with it? Well, the general answer then was that we should like to have phosphate in this program; so we produced phosphate. Now, we have tried to use this phosphate in a meaningful way in the Valley. The test-demonstration programs were a way of doing that. Now, we have ammonium nitrate in the picture that we didn't expect to have in the beginning; and we ask again how best to use ammonium nitrate in a meaningful program in the Valley. I don't know anything about your committees. I am thinking of problems TVA would like to have you people give us advice on, as you always have.

Cummings. My concern from the very beginning on this was trying to find a little more workable mechanism for transferring the thinking of this group, or at least pooling the thinking of this group, with that of the TVA personnel for the best use of the facilities here in the Valley. The procedure seemed to be a little hazy to me, and I believe it has been to some of the rest of us here, and perhaps a little bit cumbersome. If we can get a committee arrangement here that will make studies and bring recommendations to this Conference which can be debated in here and then when the Conference adjourns, you will have a composite picture of the thinking of the group with respect to these problems, I believe we will have a whole lot better program out of it. Maybe this particular question should be for the joint consideration of those two committees. I still feel that the Committee on Plant Facilities and Products has an important stake in there; I mean, important stake in its assignment.

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Young. Doctor, remember when we made our first report, that was about what we did, outline what we had in the way of plants and the products that we are making. Beyond that point I believe we were pretty well confused as to where we could go from there.

(C. H.) Cummings. Exactly.

Curtis. Of course, if you are going to set up a committee of the land-grant colleges to advise the TVA how to use the fertilizers in a meaningful program, why did you have Charlie Young as chairman of that committee?

Young. We only make the materials.
(C. H.)

Hutcheson. It seems to me one of the difficulties, maybe, is that you need an agronomist and a soil scientist appointed under you to work with you on these committees. That would be the first step. And then these men would bring in proposals to you fellows who are administrators to consider.

Clayton. These committees, as they deal with a specific problem, not only have authorization, but they have actually followed the practice of appointing subcommittees, comprised of technical people, to work on it and make recommendations to the committee. That is a part of our procedure.

Curtis. From the beginning, TVA has looked to the land-grant colleges for advice as to how to use these fertilizers. When I see a committee headed by the Authority here, I feel, perhaps, that it is going to decide whether to put this fertilizer on one kind of crop or another. Neither the Authority nor I know about that; you people know about that. The means are set up in this organization here, the means of bringing from this organization to TVA a proposal as to what will possibly be the best way to use these fertilizers.

Cummings. Actually, as I interpret the composition of these committees, the assignment, it was not a land-grant advisory committee to TVA, but it was a joint committee of USDA, TVA, and the land-grant colleges, to jointly make recommendations, to make studies, to bring to the Conference which is composed of representatives of all three for thinking on these subjects. In this way, TVA could obtain advice as a guide in the operation of its plant. The advice would be a product, not only of committee consideration, but also of thorough discussion at this Conference here by all representatives, including, of course, TVA.

Curtis. This Conference is a joint conference comprised of the land-grant colleges, USDA, and TVA, it is true. There are committees set up to accomplish certain kinds of work. If we don't

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- Curtis. get from this organization that kind of advice, then we are lost. Once we get that, then we can formulate policies to carry it on through the mechanism of distribution, but we need to get that kind of advice.
- Cummings. It doesn't matter too much, it seems to me, which committee tackles it; the Committee on Plant Facilities and Products, first of all, furnish the plant facilities and products that are available. That is where you will have to start in determining what it will have to be used for. You can come back the other way and say, what do you need, and the plants will produce that, but we haven't started in that direction recently. The research group has been bringing up the products and we know what we have to start with. Then we could see what uses they could be put to. I would be perfectly willing to see it a joint effort of the two committees.
- McAmis. Ralph (Dr. Cummings), I don't want to pursue the thing farther. It is the job of the Correlating Committee to assign these things to committees. Of course, we want to do what you want to do, but if you leave it there, the Correlating Committee will assign it to one of these committees.
- Hutcheson. I should like to offer an amendment to the motion that it be referred to the Correlating Committee for assignment to the proper committee.
- McAmis. You don't need a motion. That will happen unless you make other arrangements.
- Cooper. Is it your continued pleasure to make that motion?
- Clayton. We now have a motion by Dr. Cummings to the effect that a report be brought in to the next Conference on this matter by one of these committees, or by both of them; and so far as that is concerned, the Correlating Committee can work out the matter of getting this thing assigned to go ahead with it.
- Cummings. I can understand that might be a progress report; it might not be a final report.
- Cooper. You have the motion and the second before you.

The motion was agreed to.

The meeting adjourned at 5 p.m., to reconvene at 9 a.m., Thursday, November 30.

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OPENING OF THE CONFERENCE

Thursday, November 30, 1950

Dean Thomas Cooper, Chairman of the Conference, called the meeting to order at 9:15 a.m.

REPORT OF CORRELATING COMMITTEE

(Continued from p. 19)

Dean Thomas Cooper, Chairman of the Correlating Committee, submitted a statement and proposals for the committee (appendix, p. 86).

ADDITIONAL PROPOSALS AND RECOMMENDATIONS

Statement and Proposals of Correlating Committee

(Appendix, p. 86)

Cooper.

May I call attention again to the committees. The first committee involved is the Committee on Plant Facilities and Products, the one which we were discussing. The chairman is Director C. H. Young. The second committee is the Committee on Water and Land Use. Director Chance is chairman of that committee. The third committee is the Committee on Rural Facilities, Services, and Industry. The chairman is Dr. McArdle. The Correlating Committee particularly requests that these three committees get together and prepare and submit recommendations in their respective subject-matter fields.

Curtis.

Referring to the paragraph commencing with "Of special interest to the Tennessee Valley region," etc., that assignment overlaps pretty closely the whole question of the most effective use of the products of the TVA plants down there. I was wondering if it wouldn't be possible that the committees could also deal with the broader question. Perhaps you will cover that later on.

Cooper.

I think, Doctor, it would be a legitimate matter to undertake.

Curtis.

I am concerned about the thing because the TVA Board now is faced with making some far-reaching decisions with reference to the future of that plant down there. We would like any light that we can get on that problem. Referring to the paragraph commencing, "With the view of further establishing," will you read that time schedule again?

Dean Cooper reread that paragraph and the following two paragraphs (appendix, p. 87).

STATEMENT AND PROPOSALS OF CORRELATING COMMITTEE

Curtis.

I am a little concerned about the time schedule there because we have money in our 1951 budget to go ahead with the work that we are now carrying on in the Chestuee watershed. Since we have studied that watershed for five or six years, I think we can consider that among the watersheds in this program. We already have a project going over there, and we have five or six years of hydrologic data. With reference to the other watersheds, the TVA is at the present time looking over other suitable watersheds. When we see watersheds that look to be all right from the TVA viewpoint, we then want to approach some of these people and members of this organization to see whether it is a suitable selection that TVA has in mind. We should like to get those areas selected at an early date because we want to make a great many measurements in those Valleys, particularly hydrologic measurements. We also have inventories to take. The University of Tennessee has already agreed to make an inventory over in the Chestuee of a certain kind which will be ready by the first of January, this coming January.

Cooper.

That will be January 1951?

Curtis.

Yes. They have agreed to have a preliminary survey made. We also want to go over all of the test-demonstration data that we have in the selected watersheds. It is certainly important that we get the selection of these watersheds made at as early a date as we possibly can because we will need two or three years to get basic data before we can move in on action programs in these other watersheds.

White.

Dr. Curtis, could I make a little correction on that date? Due to the fact that we have had a pretty hard time developing this work plan budget, the earliest date which that survey can be made will be May 1.

Curtis.

I was quoting the contract. If the contract has been modified, I stand corrected.

Cooper.

What date was that you said, Mr. White?

White.

May 1, 1951.

Curtis.

I never hoped to get that January thing anyhow. When I saw that January 1 date, I did not see how it could possibly be done, anyhow, but by May, say, we will have that inventory. Of course, that inventory is supplemental to what we already have.

McArdle.

Dean, do you mind reading again those 1, 2, 3's, to see what it is that will tie in with what we are getting here?

Cooper.

May I ask one question? Is the setting up, for example, of

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Cooper. completion of the job in 1952 putting it off too long?

Curtis. 1953, you were talking about.

Cooper. The job should be completed in 1952, and the findings and recommendations published early in 1953.

Curtis. I am not sure that the work can be done, but we should like to get those watersheds selected at the earliest possible date so that we can move in on making hydrologic measurements and begin making the contracts with the various people to make the inventories. If there is any possible way of speeding that up, it would be a help to us.

Shoffner. Would there be any conflict, Dean Cooper, in what Dr. Curtis has in mind on these watersheds that he wants to start on shortly in a limited number and the proposed study that the Correlating Committee has in mind? As I gather it, it is a proposed Valley-wide study.

Cooper. I wouldn't think there was a conflict in there. Considering the way the committees have to work and the way the members are spread out, and, speaking frankly, some of the difficulties of bringing them together, the committees as a whole, I can understand your point as to the time factor.

Curtis. As I understand now, you expect the committees to submit a plan on organization by next March and from then on until the end of 1952, they will be working by that plan.

Cooper. This will represent a series of studies by various groups which the Correlating Committee will bring together.

Curtis. I don't know about our people being in contact with those committees, but some of our people are on those committees.

Cooper. We certainly had the idea that TVA was going to be in contact with them.

Curtis. We probably will be pushing for your opinions on these little watersheds.

Cooper. You will be supplied with a copy of this statement in the event that the idea is passed by the group.

I move the adoption of the statement and proposals.

Daughtrey. I second the motion.

Young. (H. N.) Dean, I think that is a good plan but for one exception. I don't think it will work too well. I don't believe that three

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Young.
(H. N.)

committees can do that job as three independent committees. I would like to make a countersuggestion. I think it is the responsibility of the Correlating Committee, maybe, to take a committee of technicians who will see the whole problem. I don't think you are going to get too far with three committees unless the three understand completely what their jobs are. We are not certain what our jobs are, how far they go. I don't believe, Dean, that you can get three committees, ever get three committees, not like our committees are, to state that problem as a whole. My judgment is that we are going to need some technical committee. When I say technical committee, I mean just that. We wouldn't have anybody here on that committee. We need a technical committee that will develop that job, state the fundamental objectives, isolate the problems to be solved; and when they get that, perhaps submit it back to the Correlating Committee. Then the Correlating Committee will be in a position to farm it out to these other committees. Until we do that, I just don't think we will get anywhere.

Clayton.

That is an excellent suggestion, Dr. Young. I may say that the Correlating Committee has had a procedure similar to that in mind. We didn't, at this meeting, want to go into the details of the organizational structure needed, but, without question, that kind of approach is essential to doing the job, in my opinion.

Young.
(H. N.)

Why don't we do it then? We are going to be wasting some time, if you delegate the job to these committees. They are not going to do the job.

Clayton.

It wasn't necessary at this time, it was thought, to set up a committee of technicians and go into other details, although that is a part of the procedure contemplated to prepare the plan of work that we suggested be developed here.

McArdle.

May I interrupt for a minute? What is proposed is, in the Tennessee Valley, to come forth in 1953 with an integrated program which would accomplish certain objectives. In order to obtain that program it is proposed that the three standing committees formulate plans for doing the job.

Clayton.

Formulate plans for getting this job done, yes.

McArdle.

In other words, this job I talked about will take us two years, and you want the three standing committees to make the plans for doing the two-year job.

Young.
(H. N.)

Is this three jobs or one job?

McArdle.

I think I am going to check with Dr. Young, if my understanding of this is correct. My experience in similar work suggests

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McArdle.

that a relatively small group can outline the plans for doing this two-year job much better than three standing committees. The committees could serve very effectively as a review board for what a small group might outline for us, but if you expect us to sit down and develop the plans for this two-year job, you are not going to get it out of our group. I should like the members of the committee to speak for themselves. I am just giving my opinion on it. Don't let's misunderstand each other. I am highly in favor of doing what is proposed here. I am only questioning the proposal for the developing of the plan for doing this two-year job by assigning it to three standing committees rather than, as has been suggested, to a smaller group of technicians.

Clayton.

Would you go along with this suggestion, Dr. McArdle? I am just following up on what Dr. Young said. If we did get a group of properly qualified technical people to formulate this approach that we are trying to get set up by March 1, could we then bring that detailed procedure and work plan to the attention of your committee and of the other two committees, for consideration and recommendations? Of course, we realize that these committees, in the sense that you describe, cannot expect to do this job, but they can serve, in the capacity that you indicate, as a review committee, and so on. We have not undertaken in this presentation here to go through the whole process of the organizational setup to get this thing done. That is a part of the job that lies ahead of us, but I find what you gentlemen have said to be entirely in line with the discussion in the Correlating Committee.

Young.
(H. N.)

This small committee is the key to the problem, organizational key to the problem. We can spend all kinds of time milling around these three committees, whereas I think we can clear this up if we can get one committee to state the problem, the whole problem. Then we can break down the various practical problems in relation to these others in these three committees, but we have got to have a clear-cut statement of the whole problem, in my judgment.

McArdle.

I am very much in favor of doing the job that you presented on behalf of the Correlating Committee. I think I understand it now, and that is to develop a recommendation for an integrated program for the whole Valley.

Cooper.

Which goes to the Correlating Committee. We are asking each of these committees to look into the detailed proposal and work plan and to submit to the Correlating Committee their recommendation in the respective subject-matter fields.

Clayton.

Let's suppose now that we clear this proposal. What would we do? It seems to me it would be useless, for example, Mac (Dr. McArdle), to call your committee together with nothing

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Clayton.

more specific than the broad proposal that we have before us now. All we have down here is the statement of what we propose to accomplish. What would be involved, then, in preparation for bringing your committee together so that it would be in a position to act in the framework of its responsibility? It seems to me, Doctor, that the first step would be to arrive at judgment as to what kind of a group, how constituted, could best formulate a comprehensive statement and plan for this job; work out the details of the undertaking. With that done, it seems to me we would be in a position, as a second step, to call Dr. McArdle's committee together and examine that detailed proposal and work plan with that committee. I should assume that we would have, at least, the leader of this technical group, or whatever you might call it, to appear before that committee and present, in general, the total job as they have outlined it and, in detail, those segments of the job which appear to be within the framework of your particular committee's responsibilities. Then we would want to get the reaction of that committee to the total proposal, the total job, and, especially, to those segments of the proposal within the framework of your particular committee. Our first step, then, would be to constitute this technical group, or this group to formulate the job, and so on. That would be the first step to take. I recognize that it would be useless to ask you gentlemen to assemble your committees to consider this matter until we had something concrete and definite to present to you. Does that offer an approach that appeals to you?

Young.
(H. N.)

That is much better, in my judgment.

Clayton.

That is in the intent back of what we put down here. We haven't attempted to spell out the organizational procedure.

McArdle.

That isn't the way I understood it. It said that we were to do that.

Clayton.

We do want to bring the work plan before these committees that represent all the agencies and get their official reaction to it.

Young.
(H. N.)

Setting up an organization that will work--that is our first job. We can make a motion to set up an organization.

McArdle.

There is another important consideration, too, and that is the feasibility of this--of the committees' being able to do it. Since our last meeting all of these groups have met once; and if the experience of the other standing committees is the same as my experience, that is, ours, I think we could function most effectively as a review committee, screening committee, for

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McArdle.

this Conference and not as technicians. If I get this correctly, I think the Correlating Committee has really hit on something that is very much worth while. I believe we are beginning to see some daylight in some of this. The proposal, as I get it, is to prepare a definite program for the Valley area, an integrated program of land and water use, or the recommendations for such a program. That is going to take about three years to develop that program.

What we are arguing about now is, somebody has got to sit down and draw up a plan of action for getting that recommended program; in other words, a plan of action for doing two years' work, if I get this straight. Dr. Young's amended proposal here is that the plan of action for doing two years' work be developed by a small group of technicians and their proposals referred to the three standing committees for preliminary screening before it comes before this group.

Curtis.

May I ask for some light on the subject? I have always understood that this Valley-States Conference was set up, originally, and claimed over the years to be the organization out of which the respective programs for the Tennessee Valley developed, this organization being made up of the three groups primarily concerned in that, the Department of Agriculture, the land-grant colleges, and the TVA. I supposed that job was going on all the time. At least, TVA has felt that it was developing a program that had the approval of this group. Is it proposed, through arrangements that may be set up, that the plan, the program for the Valley which currently is on everybody's mind, be reviewed at the present time in the light of everything that has happened and the experience we have had? If you are going to make a review now of the main function of this Valley-States Conference, I can see that. After all, this Valley program is a program of this group, it is a Valley-wide program.

Now, there are certain problems that come up because TVA has made certain decisions with respect to its support in its part of the activities, namely, to attempt to intensify development in certain watersheds. Of course, the work that is done in those small watersheds should coordinate with the Valley program as a whole. If the TVA is going to concentrate its efforts in the small watersheds (and that effort will involve activities on the part of the various units of this group), we want to select those watersheds, we want to select them soon, but in selecting those watersheds we need to know whether we are selecting them in such a way as will fit in with the general program. We can't wait. If the committee that Dr. McArdle is talking about is now going to review the whole Valley program and submit a report at the end of 1952, it isn't evident to me how we are going to select watersheds for this intensified work to carry out a program that will be coordinated with a Valley program unless you have a Valley program.

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Curtis.

Aside from that, there is another problem which confronts the TVA Board, and that is that we have a fertilizer plant down there. We have to go back to Congress every year and explain what we are doing with that plant and what we want money for, and so on and so forth. Even though the plant is making a little money, we still have to go back to Congress and say why we want appropriations to operate it and to continue to operate it. So we again are asking for guidance from this group as to the most effective use of the products of that plant down there. Of course, that is one phase of the total program again. Am I right in assuming, regardless of how it is brought out, that you want at this time to review the studies that this group has been carrying on right straight along of a Valley program? If so, the time proposed is certainly short enough, if you are going to review the whole Valley situation in the light of present conditions of what you want to drive for now. What does bother me, if we are going to select watersheds and intensify work in those watersheds, how we are going to do that, if we are not going to have anything different, anything new, in the Valley program as a whole until this review is completed.

Young.
(H. N.)

I certainly didn't have in mind a complete review of the whole program from my remarks. I had in mind a statement as a whole relative to these small watersheds. That is what I had in mind.

Curtis.

Are you talking about small watersheds, or are you talking about the Valley?

Young.
(H. N.)

It will tie up with the Valley. I am talking about these proposals over here.

Curtis.

You said there just a minute ago it had to do with the Valley.

Young.
(H. N.)

That doesn't mean a review of the whole program in the Valley.

Curtis.

Well, I am afraid I am lost.

Young.
(H. N.)

Let's speak about these three committees. I think they are going to be continually tied up in subject-matter conflicts. What we need is one statement, not three sets of charters. When you go to organize a bank or a business corporation of anything, you don't set up three committees; you set up one.

Will.

Mr. Chairman, it seems to me that if this group can agree on the objective, which I think is pretty well set forth in this 1, 2, 3 outline here, in the next to the last page of the Correlating Committee's statement, and then agree, also, that the Correlating Committee should go ahead with some such plan as that which Dr. Young and Dr. McArdle have set forth here,

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Will.

that much of the detail of this thing that is somewhat confusing now, as we have tried to grapple with it, much of that will be grist for this technical group to thresh out. I think the suggestion of Dr. Young is a very practical one, provided we understand our ultimate objective, what we are driving at in 1953. To my mind, that is pretty clear. Then let's, if we can agree on it, get this group of technicians busy right away, let them come back--this is still all under the general oversight of the Valley-States Conference and the Correlating Committee--let this group come back with a plan which has been strained through these standing committees. Personally, it seems to me if they could do that before March 1 (and I believe it would be possible for them to do that before March 1), you might speed that thing up some; get this mass of detail worked out in some fashion by the technical group. Possibly they might come in with alternative suggestions. If that could be done by, say, the middle of January or the first of February, or something like that (personally, I think it would be possible, from what little I know about such a job), then you could get that straining through the standing committees during February. Perhaps it would be about March 1 before the Correlating Committee would have something of a rather mature, well worked out nature. That would give the answers, I think, the procedural answers, the modus operandi of the whole job. I do not believe we can ever today grapple with a lot of the details.

Cooper.

You wanted, particularly, Dr. Curtis, as I understood yesterday, to know what are the recommendations of these committees as to the requirement for fertilizers. That was one of the things that you wanted to have happen.

Curtis.

Not only the requirement, but the logical use, and, in terms of that logical use, how much.

Will.

Mr. Chairman, as I understand it, the proposals of the Correlating Committee were, say roughly, in two parts; first, that these committees look into the fertilizer situation--that is on page 2. Then it goes on to say, perhaps of more importance than that is this broad job of looking ahead and trying to draw up a comprehensive broad plan for the Valley. That is the latter question which appears on page 3.

Cooper.

This refers to the statement that the Correlating Committee, in the event you approve it, proposes "to encourage and assist the initiation of region-wide work to identify and set forth the 'specific' problems and objectives in land-water relationships within the Valley--by subwatersheds and minor watersheds to the degree necessary." That is what you are referring to?

Will.

That is correct, Sir, and I was under the impression that was the thing we were discussing here. In other words, Mr. Chairman,

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Will.

that "1, 2, 3" you just read, to my understanding, will be a description of the end product of this effort which we would expect to come up with in 1953, according to this schedule. In order to get an approach to that and to get a means of going about that two-year job, as I understand it, Dr. Young and Dr. McArdle are suggesting that there be a work group (and I think it would be a job of solid work maybe for two or three weeks), a work group established by the Correlating Committee to bring in some plan for action. It might be alternate plans; they might think of more than one. Then bring that before the Correlating Committee, and the Correlating Committee use the standing committees for the official review to advise what they think about these proposals. I am just saying, Mr. Chairman, for the Department of Agriculture, that it seems to me to be entirely feasible; and I believe we would be glad to participate in it. Of course, it probably isn't the only feasible course, but I believe that that would be an immediate practicable way of getting at this job, if the group votes finally to undertake the job.

Cooper.

I think your comment on it, Mr. Will, and the explanation has been the general idea from the standpoint of the Correlating Committee. It is, at least, a method of getting an approach and of getting some action.

Will.

I might say further, if I may, Mr. Chairman, that I am quite certain that the Department of Agriculture group would wholeheartedly endorse this main suggestion for establishing a broad, integrated program in which all of the agencies can operate jointly in the Tennessee Basin. That, undoubtedly, could be developed by subwatersheds and probably in some time sequence. That is one of the details to be worked out; but the Department, I am sure, and all of the agencies would be happy to get back of this kind of proposal and work with the rest of you agencies on it.

Cooper.

I take it you are referring, particularly, to item 3, which--

Will.

Well, yes, all of those "1, 2, 3" steps. It seems to me that would be the logical major steps that you would enter into as you go about this kind of job. First of all, looking at the resource, taking an inventory of it, setting up the specific problems and the development potentials; then, second, considering alternative means of reaching the objectives; set up the objective and then develop a program of helping the people reach those objectives. That is what I think is contained in "1, 2, 3" on page 3 (appendix, p. 88).

Cooper.

Of course, I think there is no question about this being a tough job.

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Curtis.

As I understand the discussion now, it is proposed that by some means a group, part of this body, make a review of the Valley situation, what are the objectives, what are we trying to accomplish in this Valley. This organization was set up to deal with that problem and invited certain committees. This cannot be anything else but a review; I mean, the new look, another look, at the Valley as a whole. We would hope to have, in the course of time, a statement which might be adopted by this group as a whole. These are the objectives, and these are the ways which we think those objectives might be reached, the modus operandi, and so on and so forth. That would be a fine thing. However, I am worried about the time element, because TVA is at the place where we want to place our particular efforts into small watersheds. That doesn't mean that the Valley program as a whole, that is, your program, shouldn't go ahead. Next year we will have about three thousand farms outside of these little watersheds that we are talking about. We still have that test-demonstration program in the Valley as a whole, which is a part of this whole enterprise. That general test-demonstration thing will go on regardless of what TVA does. At least, we are hoping that the land-grant colleges and this group will not let that program, as a whole, decline. But TVA wants to concentrate its particular part of the total effort into small watersheds. What we get done in those small watersheds will necessarily be a pattern of what we are eventually attempting to get in the whole Valley. There is a time limit there. We need to get those small watersheds identified, and we need to get an agreement as to what kind of program we want to carry out in those small watersheds. But it does worry me on this time schedule, because we do want to get those watersheds selected so that we can begin the hydrology and the surveys, and so on, that will be necessary to establish a base in those small watersheds.

McArdle.

I think that adds emphasis to the need to have the group of really competent technicians to consider the whole field in one compact group. If my notes mean anything, by April of 1951 those small watersheds would be identified.

Curtis.

The outlook is that it can't be done that soon.

McArdle.

It may not, but that is what they would be aiming at, but I think they would have to do that in order to carry through on the "1, 2, 3."

Will.

Mr. Chairman, it seems to me that, certainly, the time element is quite important. Perhaps the group might, if it adopts the course of having a task force set up to get into this, might ask that they work with all practicable speed and beat this April 1 deadline if at all possible, and they probably could. I should like to point out also that in laying out and getting into a problem of this kind by small watersheds, which would

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Will.

be one good way to go about it, certainly, although we are thinking of a program eventually for the entire Basin; but, in any event, whether you are thinking about the Basin as a whole or a series of subwatersheds, it is a very complex job, and there are questions which require certain basic hydrologic data for their answer--and I think it is fine that the TVA is in the process of getting some of that data.

What I am getting at, Mr. Chairman, in addition to that kind of data and that phase of the problem, there are other aspects of this thing that relate to these small watersheds. There are additional kinds of physical data that are involved--soils, crop adaptation, the existing pattern of agriculture, and the potentials for possible change in agriculture. There is also the human factor. In each of these watersheds there is a certain social organization, community organization, which probably varies from watershed to watershed. In some places the people might be more nearly ready to implement such a program than others. I don't know; I don't know enough about the problem to say, but it is probable that that factor might vary from watershed to watershed.

What I am suggesting is that as this program is laid out and the job is set up, we will say, subwatershed by subwatershed, that while the hydrologic factors are important, in a job of this kind, in order to lay a plan to implement it, there has to be consideration given to all of these other factors. That can be done as this job is laid out by this technical group.

Curtis.

I didn't mean that we wanted to get started on a hydrologic basis alone; we wanted to get started on the necessary surveys.

Will.

That is right. I think, Dr. Curtis, that it is fine, it is excellent, that these measurement studies are under way, and I appreciate why it is necessary to get the schedule of work in the watersheds set up as early as possible.

Daughtrey.

Gentlemen, this thing doesn't look so complicated to me. It was about to confuse me though. As I got the Correlating Committee's report there, it seems to me that that is recognized more as a Valley-wide proposition which is going to entail some rather detailed study. TVA has some further study of these watersheds that you would likely suggest starting in first.

Curtis.

The reason we are already in the Chestee watershed is because we needed to go ahead with that. We have not selected the other watersheds as yet. We are looking over the Valley now to see where there are watersheds that represent problems from the TVA standpoint.

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Daughtrey. It would seem to me that when you come to some conclusions about that, the problem then becomes one for the States involved; and TVA would get together with the State to see if they can work out a plan for getting started in these relatively few watersheds. I don't see that we would get involved. It seems to me that it is just a question of pegging those immediate things which you want to start which may be helpful in this overall study and not hold that up because of this overall study.

Curtis. You see, the little watershed, after all, represents more or less of a miniature of the Valley. Of course, the conditions will vary from watershed to watershed, but the program, as set up in any particular watershed, needs to be more or less of a pattern of what might apply in the Valley. The problems are the same. The surveys which would be made would be the same even though you were studying on a Valley-wide program instead of one of these basic surveys. You are, in effect, laying out a pattern which represents more or less what you would like to do in the whole Valley eventually.

Daughtrey. In laying out that pattern you would assume that you would make some mistakes, that you might profit by those mistakes in developing this over-all pattern.

Curtis. That is right, but isn't it possible now, since the time element enters in here, that this committee, in considering what might be a program for a Valley could very well arrive at that by arriving at a program for a watershed. I am thinking of the time element all the time. A program for a watershed is a miniature of a program for a Valley.

McArdle. You are bringing in another thought there, Dr. Curtis, that one that you talked about yesterday. You remember that my comment tied directly to that. You develop a series of miniature programs because there is not one set of problems in the Valley but a whole set of problems. If you can identify the proper watersheds, you can get a good sample of those problems. I guess the way I understood your comment yesterday was that you could work intensively on the watersheds which are representative of the whole scope of problems in the Valley; and by these interpretations you get the programs in the Valley. That is the way I understood your comment yesterday. I think the suggestion of the Correlating Committee could be tied into that, but I didn't understand it that way. I understood it to mean the immediate development of the whole Valley program, but I think this working group could provide that the program will eventually be derived by doing it in the way that you suggest, by taking a series of sample watersheds.

Curtis. In our 1952 budget we requested funds for working in six or seven small watersheds, so we need to get a plan of what to

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Curtis.

do with those watersheds. It is obvious, of course, that we need to make some surveys first. We are starting on those next June. Meanwhile, we are going ahead very actively over in Chestuee.

McArdle.

This small group would come up with a proposal as to how the plan for the Valley is going to be developed, their recommendations for it, and they might recommend that it be developed by working on a series of small watersheds; and they might go ahead and pick out those watersheds. I should think they would have to.

Curtis.

What we had in mind in regard to the selection of watersheds is this. TVA itself is now looking over the Valley to see where there are watersheds that particularly need our particular interest, but we expect now to go to the States and work out with the States the final selections to see whether these things we have tendered the States will fit into the ideas the State people have with reference to the conditions that prevail in that State and in that area; so we will get a watershed that represents or is representative of conditions in that area. Eventually, we will have six or seven that are fairly representative of the variety of conditions we will meet over the Valley as a whole.

Will.

I am wondering, Mr. Chairman, if that process, which I think is a very necessary one, if that process of looking over the watershed and setting up some priority on it, if one way of doing that wouldn't be to make that a function of this basic job that we are talking about here in the Conference. In other words, make it a function of the Correlating Committee. Then we would have all of the agencies tied into it, whatever contribution each could make. The focal point of all of this would be the Correlating Committee. Special groups might be set up to work on details. It just seems to me, Dr. Curtis, that what you are describing there is one of the essential phases of planning a big job like this.

Cummings.

On these small watersheds, I am wondering if anyone can outline how the suggested program might differ from the intensive program carried out in Clay County, North Carolina.

Curtis.

It would cover, perhaps, more phases of the situation than in Clay County.

Cummings.

What additional phases?

Curtis.

I don't know how intensive the forestry phase was carried on there. We want to study land use from an agricultural standpoint, as it might be reflected in the stream flow; we want to study forestry; we want to study the social setup in the

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- Curtis. watershed; we want to study all of the economic factors that are involved in the watershed; we want to get our economic people working there to see what might be done to improve the economic status; and we want to get our marketing people interested; we want to get our people looking at possible small industries in the watershed; we want to get our health people working; and we want to get our engineers looking at it to see what eventually may be necessary in an engineering way to bring about the desired objectives. Now, we have had our engineers over in Chestuee, and they throw up their hands and say that clearing out the stream channels and dyking or anything of that kind would be useless, if they can't get that land tied down.
- Cummings. From the standpoint of the farm planning and the agricultural adjustments which would take place in the area, the program in Clay County and the program you visualize in the watershed will be quite similar, I judge from your comments.
- Curtis. They would be, but more intensified.
- Cummings. In Clay County, the hydrological studies have not accomplished it, and a number of the other phases have not had the intensity that the agricultural adjustment programs have. Is that about the way it is?
- Curtis. Of course, in the matter of test-demonstration farms, we have test-demonstration farms in these watersheds we have tentatively selected and, of course, in Chestuee. We want to look at those records and see what they mean. We may find from the review of the test-demonstration farms in a watershed that we do not have enough test-demonstration farms to represent the various soil types, size of the farm, and so on.
- Also, we want to look at the way of keeping records to see if we can improve the keeping of records; perhaps modify our system of records if, as a general thing, we were too ambitious in attempting to get records. We feel that we should have, probably, a simplified form of record for most of the farms, but an intensified system of records for selected farmers which would be representative; and then get records that would be susceptible to fairly accurate analysis. The people who have studies our records believe that we could develop a plan that would lend itself better to statistical analysis. So we want to accomplish that.
- In other words, we want to adjust in each of these watersheds the test-demonstration program, perhaps adding, dropping out, and getting in the watershed a logical setup of test-demonstration farms. Then we want to bring in these other phases of forestry, engineering work, health, all economic considerations, social organizations, and any others we can that will make that watershed stand out favorably as a place for people to live and to make a living.

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- Cummings. In measuring the progress that is taking place in the Valley, irrespective of the various contributing factors, has any thought been given to using sample areas taken from the general master sample units and following the progress on those units by progressive inventories, over a period of time?
- Curtis. With reference to the test-demonstration farm, it is precisely that, yes.
- Cummings. A test-demonstration farm is not a statistical sample in the same respect.
- White. We are having those samples made, Dr. Cummings, and I think we are pretty well set on the procedure to be followed.
- Cummings. I am thinking of the BAE, or whoever it is that has the whole country divided up into master sample units, maybe represent four or five, or a half a dozen farms in each unit. By some procedure or ramification, it is possible to draw a sample from that which will give you, when added up, a reasonably accurate sample which can be projected to the whole for a given area. I was thinking about that means of measuring progress that has taken place in the area, not just progress that has taken place on test-demonstration farms, but progress that has taken place in the Valley as an area which can represent test-demonstration farms plus the projection of the lessons learned on test-demonstration farms into the Valley as a whole, plus all of the other contributing factors of progress. You would take a sample which is statistically adequate to represent the Valley now and then five years hence come back and take another sample which is statistically adequate to represent the Valley, and compare inventories for the two times to measure progress in the interval.
- Curtis. We have a number of projects under way already in that general field. In the first place, the problem of selecting adequate samples is under way now to select samples on our whole test-demonstration program. We are also studying, of course, this matter of income. We have a project with Vanderbilt now in which they are devising the techniques of determining income by county.
- White. Dr. Cummings, we are just in the midst of doing exactly what I think you are talking about.
- Young.
(H. N.) I don't believe that a master sample of one percent or less of the population would be adequate.
- Daughtrey. On developing this program in the individual watershed to start with, Dr. Curtis, it seems to me that that has to be worked out on the basis of the watershed selected by the combined efforts of all folks concerned in studying that problem

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Daughtrey. and determining what are the things to be done in that watershed. To me, the procedure which you had in mind there is logical. You folks are studying it from the standpoint of TVA's peculiar efforts, and then get together with the States and the agencies involved and determine if that is a suitable watershed, and develop the program for that particular watershed. That, to me, is logical, and I can't see that particular phase on getting started with the watershed program involved and delayed in the proposed study for the Correlating Committee.

Cooper. Gentlemen, the question is whether you want to accept the proposal that has been presented by the Correlating Committee.

Young.
(H. N.) Dean, I think the only thing we are disagreeing on--we are not in disagreement with the program, we are not in disagreement with the objectives; we are in disagreement with one little thing, one little point of organization.

McAmis. I think Dr. Young is right; we certainly need to bring these things together. You remember, we discussed a good deal the question of setting up a new group. We hoped, at least, in making this, that it was possible to set up a technical group within the framework of these committees. If we don't, we will be dealing with another group, now, and will add to the confusion. We recognized, certainly, that we needed technical people working on it. You remember, in each of the committees, the plan was that they would call all the technical help of these agencies, or others, if they wanted to. I certainly hope that we can deal with what Dr. Young and Dr. McArdle are talking about within the framework of the committees.

McArdle. May I comment on that? If that means that each of these three standing committees has got to direct preparation of this plan of how we are going to go about getting these recommendations for this integrated program, that ties right back to my original comment; I don't think my committee can do it. They are busy people and do not have the time to direct that work. We would still have the further disadvantage of three groups making plans on how you are going to go about this. I am in favor of being very specific about it. I think this is what Dr. Young had in mind and if it is, I am for it. Let us get one group of technicians. Let them develop a plan of how to go about deriving recommendations for an integrated program. Let these three committees, if you want them to, review the plan which is developed by this one group.

Clayton. Would you make that a motion so that we can get this thing settled--to see whether we can get a second to it?

White. I think what McAmis has said isn't different from what Dr. Young is talking about at all. We feel that on these committees there is technical competence, and if we can draw from

STATEMENT AND PROPOSALS OF CORRELATING COMMITTEE

White.

these committees that technical competence, and let them draw into that an additional amount of technical competence, you get exactly what Dr. Young is pointing for; and it makes sense. But if you go out here and get totally new, inexperienced people who perhaps have never sat in this Conference and have no idea of the trend that has taken place, then we lose the very thing that Dr. Young is talking about, as a nucleus, for that must come from these three committees. I think in those three committees there is the nucleus of this very thing that Dr. Young is looking for. If we can take that and provide for their drawing in any other help that they want to draw, these committees can work effectively. That is what I thought was intended all the time; that is why these committees were set up.

Curtis.

Isn't this actually a job of the Correlating Committee? What is the Correlating Committee, a bunch of amateurs? I think it is the job of the Correlating Committee, by whatever means they may command, to bring this in next April. The Correlating Committee has at its command all of the technical competence of this whole group. I think there are other groups which should be represented in this planning. For instance, we have a lot of State people, the State Conservation Departments, the State Planning Commissions, the State Educational and the State Health Departments. We have a lot of State agencies that certainly are concerned with this whole matter, besides the people that are represented in this group. The Correlating Committee has all the power and authority to do this job. What is it supposed to do?

Will.

Mr. Chairman, our member of the Correlating Committee, Jimmy Dykes, isn't here today. I think, however, I might throw in something at this point, because I discussed it with him last night. I believe our position as a member of the Correlating Committee would be about like this. First of all, we would agree with Dr. Curtis' suggestion that a good way to do this is to recognize that this is a job of the Correlating Committee and to go about it in the best way possible in their judgment but with the admonition that they utilize the standing committees to the best possible advantage and that they take the additional steps that may appear necessary in this particular job.

I think the Department of Agriculture's contribution to this could be much more effective if there was that kind of flexibility. I am just speaking from the standpoint of what we can contribute in this joint effort. As to our membership in these three standing committees, we surely could use those men in this particular effort, but I think that we can make a much better contribution if we would pull in some others that I am thinking of that would be able to devote solid working time to this job. If that principle could be established

PROCEEDINGS

Will. that the Correlating Committee go ahead and use the technical resources and the personnel of standing committees and other resources that may be available, then I think the USDA could make a more effective contribution than they otherwise could.

McArdle. I move the adoption of the proposals of the Correlating Committee as read by Dean Cooper, with the exception that the following paragraph be deleted: "It is proposed that each of the standing committees of the Conference meet as soon as practicable and outline the scope of such work as they are respectively concerned with. A plan for conducting the work should be prepared by each committee."

Cooper. That is to be deleted?

McArdle. That is right.

Cooper. Is there any further discussion of the motion?

The motion was agreed to.

McArdle. In order to get an orderly concept in my mind, we have agreed to undertake a job that will take about two years to do. We have got to make a plan for doing that job. Somebody has got to make it. It is to be left up to the Correlating Committee for getting that plan made, or do we want to make some definite arrangements here? I am concerned about it because my motion, you see, took the meat out of that thing for making the plan; and I want to make sure that it is back in there again. We have got to make arrangements to make this plan to get the work done.

Will. Mr. Chairman, it isn't a question of whether this group must give some further instruction or admonition to the Correlating Committee. It seems to me it is a question of whether you wish to or whether you don't. You can do it either way, it seems to me.

McArdle. I move that arrangements for getting this plan made for the two-year job be left with the Correlating Committee, with the suggestion that the Correlating Committee consider the desirability of accomplishing the making of a plan by engaging a small task force of technicians who will actually put the plan together; and that the Correlating Committee further make the fullest possible use of the present standing committees of the Conference to review that plan before it is presented to the Conference.

Young.
(H. N.) I will second the motion.

The motion was agreed to.

STATEMENT AND PROPOSALS OF CORRELATING COMMITTEE

Cooper. That means that the Correlating Committee has placed upon it the very broad responsibilities stated in Dr. McArdle's motion, which include engaging the necessary forces for the work and getting the job done.

McArdle. You might want to discuss the time schedule that Dr. Curtis was talking about. If you employ a task force of full-time specialists--it needn't be more than three or four people--you can get this accomplished before April 1 if you want to.

Curtis. Of course, TVA has the final responsibility for its own decisions. But we have always wanted to consider all the facts in connection with any decision to be certain it was as good and wise as possible, in the light of what each of us is doing while working together on this Valley program. We welcome the chance to talk to the people who are to be appointed, just as we have always talked to the standing committees, and certainly we will talk to all others who can give us help in seeking the wisest possible decision, as I am sure each other agency represented here today will do.

Cooper. Will you talk to the Correlating Committee?

Curtis. Certainly, we will talk to the Correlating Committee and seek, as we always have, information from every source that we can. We have to make decisions currently so we would like all the information concerning what all of us are doing all the time. We make decisions now in the light of what we know. Next week, next month, or next year we will make decisions in the light of what we then know. TVA is a going concern as are all the others meeting here today; we believe in and use these committees; such contacts afford excellent advice; and we have existing contracts with the various cooperating institutions to assure the full exchange of information and wise decisions, joint decisions in many instances. The Board will continue making decisions to carry out TVA's responsibilities but they will be made, as I say, in the light of all pertinent facts which can be afforded through existing devices and any new or better ones which we can develop with each other; so this isn't stopping anything which we have done before but is merely providing additional light and information which should be helpful to all of us. So far as TVA is concerned, we look forward to more progress on the part of all of us in seeing to it that the whole Valley program goes ahead.

McArdle. I think that will have to be true of all other agencies involved. May I make one final suggestion? Do you want to, insofar as the possibilities of getting help from the principals involved here, get membership for this task force? It would take a little time, Cap (Mr. Clayton).

Clayton. We don't want to get our hands tied too much on that, Doctor (Dr. McArdle). I would rather, personally, that the committee

PROCEEDINGS

Clayton.

be given a free hand in exploring those channels and possibilities than to get tied up before we have been able to think it through and talk it through, and so on. My own reaction would be to let that rest.

Young.
(H. N.)

The organizations represented here might express to you the desire to cooperate.

Cummings.

I think that is implied in the motion.

Cooper.

Of course, personally, as a member of the Correlating Committee, Doctor (Dr. Young), I should like for the groups that are involved to indicate what they think is available, just as a matter of information.

Young.
(H. N.)

You mean available personnel?

Cooper.

Available personnel. They have all been participating here in this discussion; not only available personnel, but viewpoints. It might appear to handicap us a little, but it might not. It might be a very helpful thing. The point that I have in mind is that while we have this fresh in mind, if we can get from the groups involved their comments, not to accept or agree to accept or anything else, it will be very helpful to have them, especially in the setting up of a kind of program that you gentlemen have been talking about.

Curtis.

TVA will submit a letter as to our available personnel.

Will.

USDA will be glad to get into that and give you our very best comments in a letter, suggestions about personnel contributions we might be able to make.

Curtis.

There is one point I should like to mention, Dean Cooper. As we move into these little watersheds, we find ourselves in contact with people who are not represented in this Valley-States Conference. We have been working very closely with all of the State agencies; so it should be recognized that in that Valley program there are, particularly, these State agencies; and when you get down to the local area, of course you run into the county engineers, so there are representatives that are outside of the group that we have right here.

Will.

Dr. Curtis and Mr. Chairman, I wonder if you might think as a matter of protocol, and so on, it might be advisable for the Correlating Committee, or TVA, or somebody, to make formal clearance with the heads of these various agencies, State and Federal, just to tie in at some point to the administrator?

Curtis.

So far as TVA's own program is concerned, we have those contacts and we naturally consult them. I merely mention that

STATEMENT AND PROPOSALS OF CORRELATING COMMITTEE

Curtis. there are other agencies, not represented here, that are concerned with the Valley program.

Clayton. That matter, Dr. Curtis, has been brought up before to this Conference; and the Conference adopted a general rule that we might have in the Conference associate and affiliate members. At any time that this Conference chooses to do so, it can add the agencies that you mention to its membership. The reason for the distinction between associate, affiliate, and regular members is that the groups represented here cooperate under a memorandum of understanding which they have jointly signed. These other agencies that might be brought in as associate or affiliate members are not parties to that memorandum. We have also provided for the representation on our standing committees of those agencies that may be admitted to the Conference.

Cummings. Mr. Chairman, I wonder if this report could be distributed to membership of the Conference right away, so that we can have that before us as we write to you.

Clayton. We will send it out right away, as amended.

OTHER BUSINESS

Cooper. Do we have any other business to bring before this group?

The meeting adjourned at 11:30 a.m.

PROCEEDINGS

APPENDIX

TENNESSEE VALLEY AGRICULTURAL CORRELATING COMMITTEE

PROCEEDINGS
THIRTY-FOURTH VALLEY-STATES CONFERENCE

Andrew Johnson Hotel, Knoxville, Tennessee
 Wednesday and Thursday, November 29 and 30, 1950

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* * * * *

ROLL OF CONFERENCE^{1/}Alabama

Reaves, R. M., Assistant District Agent, Agricultural Extension Service,
 Athens

Georgia

Brown, Walter S., Associate Director, Agricultural Extension Service, Athens
 Murray, C. C., Dean, College of Agriculture; Director, Agricultural Experiment Station, Experiment; and Director, Agricultural Extension Service, Athens

Kentucky

Cooper, Thomas P., Dean, College of Agriculture and Home Economics, and
 Director, Agricultural Experiment Station and Agricultural Extension Service, Lexington

1/ See text, p. 11

VALLEY-STATES CONFERENCE

Mississippi

Jones, L. I., Director, Agricultural Extension Service, State College

North Carolina

Cummings, R. W., Associate Director, Agricultural Experiment Station, Raleigh
 Shoffner, R. W., District Farm Agent, Agricultural Extension Service, Raleigh
 Weaver, D. S., Director, Agricultural Extension Service, Raleigh

Tennessee

Brehm, C. E., President, University of Tennessee, Knoxville
 Chance, Frank S., Vice Director, Agricultural Experiment Station, Knoxville
 DeFriese, Frank M., Assistant Farm Management Specialist, Agricultural Extension Service, Knoxville
 Ewing, John A., Assistant Director, Agricultural Experiment Station, Knoxville
 McReynolds, E. C., Associate Director, Agricultural Extension Service, and Coordinator of Cooperative Programs, College of Agriculture, Knoxville

Virginia

Daughtrey, W. H., Associate Director, Agricultural Extension Service, Blacksburg
 Dunton, H. L., Head, Agronomy Department, Blacksburg
 Hutcheson, John R., Chancellor, Virginia Polytechnic Institute, Blacksburg
 Young, H. N., Director, Agricultural Experiment Station, Blacksburg

Tennessee Valley Authority

Ball, Howard E., Administrative Analyst, Knoxville
 Baker, Willis M., Director, Division of Forestry Relations, Norris
 Bass, Neil, Chief Conservation Engineer, Knoxville
 Curtis, Harry A., Director, Knoxville
 Kilbourne, Richard, Assistant Director, Division of Forestry Relations, Norris
 Forster, M. G., Assistant to the General Manager, Knoxville
 McAmis, J. C., Office of Chief Conservation Engineer, Knoxville
 Moon, J. W., Assistant Director, Division of Agricultural Relations, Knoxville
 Seigworth, K. J., Chief, Forest Development Branch, Division of Forestry Relations, Norris
 White, E. H., Director, Division of Agricultural Relations, Knoxville
 Young, Charles H., Director, Division of Chemical Engineering, Wilson Dam, Alabama

U. S. Department of Agriculture

Cook, Howard L., Office of the Secretary, Washington, D. C.
 Dykes, J. C., Assistant Chief, Soil Conservation Service, Washington, D. C.
 Gaston, T. L., Assistant to the Chief, Soil Conservation Service, Washington, D. C.

ROSTER

U. S. Department of Agriculture -Continued

Hutchinson, Knox T., Assistant Secretary of Agriculture, Washington, D. C.
Kepner, P. V., Assistant to the Director, Extension Service, Washington, D. C.
McArdle, R. E., Assistant Chief, Forest Service, Washington, D. C.
Will, Ralph R., Office of the Secretary, Washington, D. C.

Correlating Committee

Cooper, Thomas P., representing Land-Grant Colleges, Lexington, Kentucky
Dykes, J. C., representing U. S. Department of Agriculture, Washington, D. C.
McAmis, J. C., representing Tennessee Valley Authority, Knoxville, Tennessee
Clayton, C. F., Executive Secretary, Knoxville, Tennessee

VALLEY-STATES CONFERENCE

PROGRAM^{2/}

November 29, 1950

Morning Session

Opening of Conference	Thomas Cooper, Chairman
I. Report of Correlating Committee	Thomas Cooper, Chairman
II. The relation of the Tennessee Valley watershed to its streams	Harry A. Curtis

Luncheon

Arrangements have been made for a group luncheon, to begin at 12:15 p.m., at the Andrew Johnson Hotel. At the luncheon, Chancellor John R. Hutcheson, Virginia Polytechnic Institute, will address the Conference.

Afternoon Session

III. The relation of the Tennessee Valley watershed to its streams	
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Discussion	R. E. McArdle
Discussion	C. E. Brehm
Discussion	W. M. Baker

November 30, 1950

IV. The relation of the Tennessee Valley watershed to its streams	
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Round-table discussion; morning and afternoon sessions

V. Other business

VI. Adjournment of Conference

2/ See text, p. 11.

REPORT OF CORRELATING COMMITTEE^{3/}
by
Thomas Cooper, Chairman

PROGRESS REPORT

Agency Cooperation in the Tennessee Valley

Special Advisory Committee

The following correspondence supplements the report on the work of the Special Advisory Committee which was submitted to the Conference at its meeting on May 12, 1950.

Letter from Knox T. Hutchinson to George F. Gant. On May 25, 1950, Knox T. Hutchinson, Assistant Secretary of Agriculture, wrote George F. Gant, General Manager, Tennessee Valley Authority, as follows:

Dear Mr. Gant:

This is in reply to your letter of May 8.

Your assumption is consistent with our viewpoints. We do hope the scope of the discussions by yourself and Mr. Dykes will include consideration of all practicable methods for cooperation or teamwork between the TVA and this Department in helping landowners and operators with their soil and water conservation problems.

Sincerely yours,

/s/ K. T. Hutchinson
Assistant Secretary

Letter from Thomas Cooper to George F. Gant. On July 15, 1950, Thomas Cooper, Chairman, Correlating Committee, wrote George F. Gant, General Manager, Tennessee Valley Authority, as follows:

Dear Mr. Gant:

At the meeting of the Correlating Committee on July 12, I was instructed to call your attention to the action of the Advisory Committee and the Correlating Committee on November 29, 1949, by which you were to undertake to draw up a mutually acceptable proposal relating to administrative arrangements for carrying on the work of the Soil Conservation Service in the joint cooperative program in

^{3/} See text, p. 11.

CORRELATING COMMITTEE

the Tennessee Valley for submission to the Advisory Committee. The Correlating Committee will appreciate it if you will formally advise as to the progress made and present status of the assignment so that the Special Advisory Committee and the Correlating Committee may plan to conclude reports on the subject.

Sincerely yours,

/s/ Thomas Cooper
Thomas Cooper, Chairman
Tennessee Valley Agricultural
Correlating Committee

A similar letter was sent to Mr. J. C. Dykes.

Letter from George F. Gant to Thomas Cooper. Dean Cooper's letter of July 15 was initially answered by Mr. Gant on August 1, but this reply was later revised on the basis of correspondence between Mr. Dykes and Mr. Gant, so that they were able to present a single report, which was not the case at the time of Mr. Gant's letter of August 1.

The letter of August 1 was therefore withdrawn, and the report as agreed upon, dated November 17, follows:

Dear Dean Cooper:

This is in reply to your July 15, 1950, request for a status report on the assignment from the Correlating Committee and Special Advisory Committee to Mr. Dykes and me to prepare a plan for administering a single program of farm planning in the Tennessee Valley. I regret to report that, despite some intervening developments which gave hope at the time that agreement on such a plan was possible, the situation now is fundamentally the same as I reported to you in my letter of February 24, 1950. Subsequent to February 24, 1950, we received encouragement that further negotiations might prove fruitful; however, the Department seems now to have indicated finally its unwillingness to carry on discussions on this subject within the framework of the Memorandum of Understanding, which in my judgment leaves Mr. Dykes and me, and the Special Advisory Committee, without a policy guide.

As you know, the basic question which has been the subject of discussion and negotiations down through the years was whether SCS could make its contribution to the Valley program in cooperation with existing organizations within the framework of the Memorandum of Understanding which provides for a unified regional program. This question was still unresolved at the time of the fourth meeting of the Special Advisory Committee on January 31, 1948. As a step toward settling that fundamental question, Dean I. O. Schaub proposed a joint survey participated in by all agencies to determine a program for groups of farms having similar characteristics. That proposal, executed through a technical committee of specialists representing all participating agencies, proceeded on an experimental basis in Haywood County, North

AGENCY COOPERATION

Carolina, and the gratifying progress of the experiment was the subject of the November 29, 1949, meeting of the Special Advisory Committee and the Correlating Committee. At that meeting the parties approved without reservation the procedure which had been developed in Haywood County as a method by which it was possible for the agencies, on a unified basis, to develop guides to farm planning. The next problem was to find an administrative device under which such a single program of farm planning could be conducted. No conclusion was reached on this question and Mr. Dykes and I were given the assignment of developing a mutually acceptable plan of administration, taking into account the thoughts expressed in the meeting.

Up until this time the status quo had been maintained with regard to the approval of applications from soil conservation districts in the Valley area, a matter which had been the subject of discussion among the parties, with particular reference to North Carolina, just six weeks prior to the November meeting. The minutes of the November meeting make it quite clear that, pending the development of a plan by Mr. Dykes and me, and implicitly assuming due diligence on our part, the status quo would continue to be maintained.

Mr. Dykes and I met in my office on December 14, 1949, in an effort to work out such a plan. Mr. Dykes presented a tentative plan based on the organization of soil conservation districts in the Valley and I proposed a tentative plan which assumed SCS assistance would be provided to such local organizations as might sponsor the farm planning program and that such organizations need not necessarily be soil conservation districts. It was anticipated that existing farm organizations sponsoring test-demonstration activities would not only be permitted, but would be encouraged, to sponsor the farm planning program. Mr. Dykes and I prepared notes covering this conference for use in getting the advice of our principals.

On January 9, 1950, the Department, through a letter from Assistant Secretary Hutchinson, advised Mr. Hornsby, Chairman of the Tennessee State Soil Conservation Committee, that the Department would extend assistance to any new districts organized in the Valley, thus terminating, in my judgment, the status quo. Copies of the letter were sent to Mr. Dykes and me. This letter left the impression that SCS services could be rendered only to districts. This point was crucial and seemed to require immediate clarification in view of my tentative understanding with Mr. Dykes. I discussed it with Assistant Secretary Hutchinson on January 16, and understood from that conversation that the letter was not intended to preclude the development of a plan under which the Department would extend service to farmers through organizations other than districts. This conversation was confirmed by my letter of January 19. Mr. Dykes' idea of the time of the termination of the status quo is that it was when the Department made SCS assistance available to the Henderson and Watauga districts in North Carolina on February 9, 1950.

CORRELATING COMMITTEE

The Assistant Secretary's clarification of this point was greatly encouraging. However, on February 9 he again wrote setting up criteria for the kind of organization with which SCS would cooperate as a matter of policy, which criteria, as a practical matter, limited SCS assistance to soil conservation districts, if and when they were created, and excluded existing farmer groups not organized as soil conservation districts. The Department's position meant that further discussions, if any, would necessarily be based upon an abrogation of the Memorandum of Understanding. I so reported to you and the Department on February 24, 1950, stating that there seemed to be no point in continuing discussions.

On April 3, 1950, I again received new hope from Assistant Secretary Hutchinson that we had misunderstood the Department's position or that the Department had changed its views. He stated that his letter of February 9 "does not close the door to TVA or any other agency in the Valley which will cooperate in carrying out our soil and water conservation work." We were thus encouraged to believe that SCS might yet be willing to participate in the regional program under the provisions of the Memorandum of Understanding. TVA therefore responded on April 13, 1950, asking a definite answer to the basic question whether the Department would consider extending SCS assistance to the Valley through existing organizations. The Department avoided responding to this direct inquiry, but instead asked whether TVA would be interested in working with districts. We replied on May 8 that we had assumed that both questions--TVA relations with districts and SCS relations with existing farmer organizations--were open to negotiation. Assistant Secretary Hutchinson confirmed that assumption on May 25, 1950.

The Department's confirmation that the basic question was still open to negotiation gave new vitality and hopefulness to my discussions with Mr. Dykes. I met with him in Washington on June 13, the earliest mutually convenient date that could be arranged after the April 3 letter seemed to provide again a basis for discussion, but found that the Department had reverted again to the position set forth in the February 9 letter to Mr. Hornsby. A result of that meeting, and a subsequent discussion by Mr. Dykes with Assistant Secretary Hutchinson and the Solicitor of the Department, was a clear statement to me from Mr. Dykes on June 14 that there was no prospect that the Department would "relax" its criteria outlined in the February 9 letter.

We are now back where we were on February 24, the date of my last report to you. It seems now, as it did then, impossible to reach an agreement with the Department on a method of cooperating through land-grant colleges with existing organizations of farmers in the Valley. The Department has made it plain that it will make SCS assistance available only to legal organized conservation districts that meet the criteria fixed by the office of its solicitor. The Department's position is, in my opinion, not consistent with the purpose of the Memorandum of Understanding.

Mr. Dykes and I have no framework within which to continue discussions pursuant to the assignment from the Special Advisory Committee, unless

CLASSIFICATION AND ANALYSIS OF FARMS

the Special Advisory Committee receives further instructions from the principals.

I am attaching copies of the correspondence referred to herein.

Very truly yours,

George F. Gant
General Manager

Final Report to Principals

In view of these developments, the Correlating Committee proposes to prepare and submit a final report to the principals on the assignments made to the Special Advisory Committee.

Classification and Analysis of Farms in the Tennessee Valley

Proposed Review and Publication of Report of Study in Haywood County, North Carolina

In line with the recommendation made at the last Conference, a check has been made to determine the feasibility of issuing a printed report of the study in Haywood County, North Carolina; and a committee, comprised of Messrs. John Blackmore, Tennessee Valley Authority; Samuel W. Atkins, Bureau of Agricultural Economics; John L. Brown, Soil Conservation Service; Lester E. Odom, Division of Soil Survey; Brice Ratchford, North Carolina State College, has been tentatively selected (but not actually appointed) to review and revise the material for proposed publication. Director D. S. Weaver has canvassed the agencies concerned and will report to you on the present status of this matter.

Committee on Method and Procedure for Farm Classification and Analysis in the Tennessee Valley

This committee was appointed by the Committee on Water and Land Use on December 14, 1949, to prepare and submit a report on the following items:

1. Review the methods employed in the farm classification and analysis study in Haywood County, North Carolina, and suggest such changes or improvements in method as the committee may find to be desirable.
2. On the basis of the methods proposed, suggest a procedure for applying the method on a regional basis in the Tennessee Valley.

CORRELATING COMMITTEE

The membership of the committee is as follows: Lester E. Odom, Chairman, Samuel W. Atkins, H. J. Bonser, J. W. Moon, and Kenneth J. Seigworth. On September 19, 1950, the committee submitted its report, entitled "Suggested Outline of Methods and Procedure for Farm Classification and Analysis in the Tennessee Valley." Copies of this report have been distributed to members of the Committee on Water and Land Use for their consideration.

Standing Committees

The following changes have been made in the membership of standing committees:

Committee on Plant Facilities and Products. Dr. Randall J. Jones, Mississippi State College, has been appointed to membership of this committee for a term of three years, beginning October 5, 1950, to succeed Dr. Ralph W. Cummings, whose term has expired. Dean N. D. Peacock has since succeeded Dr. Jones.

Committee on Water and Land Use. Mr. T. L. Gaston, Soil Conservation Service, has been appointed as a member of this committee for a term of three years, beginning on October 5, 1950, to succeed himself.

Committee on Rural Facilities, Services, and Industry. Director D. S. Weaver has been appointed a member of this committee for a period of three years, beginning on October 5, 1950, to succeed Director Frank J. Welch, whose term has expired.^{4/}

Next Meeting of Conference

The Correlating Committee recommends that the next meeting of the Conference be held in Knoxville, Tennessee, on Wednesday, April 4, 1951.

STATEMENT AND PROPOSALS OF CORRELATING COMMITTEE^{5/}

As a further contribution to the discussion of the Conference, the Correlating Committee presents the following statement and proposals:

As has been pointed out, the functioning of TVA's dams, reservoirs, and hydroelectric power plants is profoundly affected by what happens to water falling on the tributary watersheds. These units handle the water which drains from the watershed into the streams; both the proportion of total rainfall reaching the streams and its rate of delivery to the streams are of great importance in determining the effectiveness with which they can function. Within many of the tributary watersheds which

^{4/} Subsequent to the meeting of the Conference, Mr. J. W. Moon, Tennessee Valley Authority, was appointed as a member of the Committee on Rural Facilities, Services, and Industry, to fill the unexpired term of Mr. E. H. White, who has retired from the Tennessee Valley Authority.

^{5/} See text, p. 54.

STATEMENT AND PROPOSALS

collectively comprise the Tennessee Valley, important local problems of water control are inseparably related to opportunities for beneficial adjustments in land use and full development of land and water resources.

Reed W. Bailey, in an article entitled, "Watershed Management: Key to Resource Conservation," published in the Journal of Forestry for September 1950, has also stressed the fundamental relationships of land use and stream flow.

Mr. Bailey states:

There is an intimate relationship between land condition and hydrologic behavior. This has been recognized by early investigators and more recently thoroughly demonstrated by research. Regulating stream behavior and maintaining soil stability through land management was advanced as a guiding principle over 40 years ago at a White House Conference by the late geologist, Dr. Thomas C. Chamberlin. He put it this way: "The key lies in due control of the water which falls on each acre." In support of this principle he went on to say, "The highest crop values will usually be secured where the soil is made to absorb as much rainfall and snowfall as practicable. . . . This gives a minimum of wash to foul the streams, to spread over the bottom lands, to choke the reservoirs, to waste the water power, and to bar up the navigable rivers."

Subsequent experience and research have shown us the wisdom and value of his insight. And today the basis of modern conservation practices is the control of water where it falls as snow or rain.

These land-water relationships are of central importance. They are the basis of our research and testing programs and they are of major concern in any program of land use in the Tennessee Valley.

Of special interest to the Tennessee Valley region is the possible curtailment of fertilizer output by TVA plants by reason of the use of these facilities to meet national defense requirements. The Committee on Plant Facilities and Products might usefully explore with the Committee on Water and Land Use desirable ways and means of adjusting to this situation, should it arise, with least damage to land-water conservation and agricultural production. These two committees, as well as the Committee on Rural Facilities, Services, and Industry, are requested to assemble full information as to program outlook in the field of fertilizer and munitions development and submit to the Correlating Committee appropriate recommendations in their respective subject-matter fields.

The Correlating Committee can provide each of the standing committees with a tabulation to show current and proposed projects and

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activities in these, and other, phases of work in the Tennessee Valley.

Of broader and more lasting significance, however, is an examination of problems and fitting together of objectives that seem best for the entire Valley. Important objectives of TVA focus on the land-water relationships. Programs to achieve these objectives need to be made consistent with sound programs of farm and timber production. This point is mentioned merely to emphasize the importance of a careful examination of problems and overall objectives in the Valley. And such an examination, if productive, must consider objectives in the setting of the Tennessee Basin--of particular problems confronted, its special and unique facilities, and its distinctive opportunities.

Subject to the concurrence of this Conference and to the approval of the principals, the Correlating Committee proposes, also, to encourage and assist the initiation of region-wide work to:

1. Identify and set forth the "specific" problems and objectives in land-water relationships within the Valley--by subwatersheds and minor watersheds to the degree necessary.
2. Develop suggestions and recommendations for each type of research work, educational activities and technical and other assistance needed, including the extent to which each may serve to meet the specific problems and attain objectives that fall within the Tennessee Basin development program.
3. Recommend an integrated program of research work, educational activities and technical and other assistance needed for the Tennessee Basin in line with the "specific" objectives mentioned in item 1 above.

With the view of further establishing these broad guides as soon as possible, the committee believes this job should be completed in 1952 and the findings and recommendations published early in 1953.

It is proposed that each of the standing committees of the Conference meet as soon as practicable and outline the scope of such work as they are respectively concerned with. A plan for conducting the work should be prepared by each committee.

The Correlating Committee requests that plans for this work be submitted to it by the standing committees not later than March 1, 1951. The general plan of work can then be prepared and presented to the Conference at its meeting in April. It is hoped that work can be started in the spring.

The statement and proposals were amended by deleting the following paragraph (p. 72):

It is proposed that each of the standing committees of the Conference meet as soon as practicable and outline the scope of such work as they

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are respectively concerned with. A plan for conducting the work should be prepared by each committee.

The succeeding paragraph was accordingly revised to read as follows (p. 88):

The Correlating Committee proposes that plans for this work be prepared and submitted to it not later than March 1, 1951. The general plan of work can then be prepared and presented to the Conference at its meeting in April. It is hoped that work can be started in the spring.

A motion relating to procedure for preparing a plan of work for the two-year job was then adopted by the Conference, as follows (p. 72):

That arrangements for getting this plan made for the two-year job be left to the Correlating Committee, with the suggestion that the Correlating Committee consider the desirability of accomplishing the making of a plan by engaging a small task force of technicians who will actually put the plan together; and that the Correlating Committee further make the fullest possible use of the present standing committees of the Conference to review that plan before it is presented to the Conference.

RELATION OF TENNESSEE VALLEY WATERSHED TO ITS STREAMS

by
 Harry A. Curtis^{6/}
 Director, Tennessee Valley Authority

Chairman Cooper (introducing Director Curtis): When the plans were made for this thirty-fourth conference some time back, there was an idea of bringing out at this particular meeting something as to the relationship of the development of the Tennessee Valley watershed to its streams. Some months ago there was considerable discussion in the committee as to what might be a foundation for further development, so far as this area is concerned. I will ask Dr. Curtis if he will not open the discussion on the relation of the Tennessee Valley watershed to its streams. Of course, all of you know of Dr. Curtis' experience and background and his very great interest in the Valley and in the leadership that he has given us.

Director Curtis: I am sure that some of you will be tired of hearing me talk about this subject, particularly you men of TVA; and I have also talked about it before the Valley-States Conference. I will say, however, I very seldom lose an opportunity to talk to industrial folks and city folks about the relationship of the watershed to the streams. On the other hand, I lose no

^{6/} See text, p. 19.

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opportunity to talk to people concerned with agriculture, pointing out that they also have an interest in and a stake in the river. So with that apology, I will talk about the relation between the watershed and the streams of the Tennessee Valley.

As all of you know, the TVA is attempting to carry out, in cooperation with the institutions and people of the Valley a coordinated development of the resources of the area. One of the greatest resources of the Valley is the one that was least utilized in 1933, the river itself and its tributaries. Today, the river is serving the area in many ways. The once damaging floods have been brought under control, the main channel is now navigable from Knoxville to the mouth of the river, and its falling water generates electric power. The low rates for electric power have brought about an increase of industry and has benefitted agriculture in the Valley. Low-priced electric power flows into the homes and villages, towns, and farms of the Valley. The individual purchaser of electricity in the Valley pays about half the national average rate and uses approximately twice as much electricity. It seems obvious that all of us who live in the Valley have an interest in and a stake in the development of the river as one of our chief resources. We want to keep our rates as low as possible, we want to develop new industry, we want the benefits of cheap electricity in homes; and we mustn't forget that we who live in the Valley must, by law, repay to the Federal Treasury the total investment in the power facilities developed by the TVA. But whether we live in the cities or on the farms, we have a stake in the river as one of the great resources of this area.

The river system of the Valley receives nearly all of its water from the watershed; and there is a complex and dynamic relationship between the watershed and the streams. Of all the rain that falls on the watershed, only about 42 percent of it, on the average, ever gets into the streams. The watershed turns about 58 percent of the rain back into the air. These are long-time average figures. The month-to-month and year-to-year flow of the streams depends not alone on rain distribution, but also upon conditions that prevail on the watershed.

We have, on the average, 51 inches of rain in the Valley; if the long-time average flow of the river at its mouth be compared with the average rainfall, it appears that the river receives the 42 percent mentioned. The rainfall of the Valley varies from year to year, ranging from about 25 percent below the average to 25 percent above. Statistically, the rainfall is above average in January, February, March, June, July, August, and December. It is somewhat below average in April and May, and much below in September, October, and November. Statistically, March and July are the wettest months, and October is the driest. However, when the records over a 60-year period, say, are examined, it is found that any month of the year may be a very dry month or a very wet month.

The TVA has constructed a system of dams and reservoirs in the river for the purposes of flood control, navigation, and generation of power. These reservoirs must, under law, be operated, first, to accommodate navigation and for the control of floods; the generation of power is secondary to the two major interests. This results in some limitation of the power that can be generated as compared with the power that could be produced if the reservoirs were operated solely for power purposes. There is very little conflict between the operation of the reservoirs for the generation of power and their use in providing navigation, because

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there is now a series of slack-water pools that provide a navigable channel with the addition of a few short canals. But to provide navigable channels, water must be released from the reservoirs occasionally. Most of the time, however, the channel takes care of itself. In order to accomplish flood control, and to accomplish a greater amount of flood control than could be provided by a series of little flood control dams, the large, multiple-purpose reservoirs on the tributaries are drawn down late in December and are held at low levels through the January, February, and March period, during which time, according to records, all of the major floods in the Valley occur. Beginning about the middle of March for some of the reservoirs and about the first of April for others, the reservoirs are allowed to fill. During that filling period, there is still a reserve against unexpected weather, but the hope is that by the time the rainy season has passed, the reservoirs will be near their normal high-pool levels. In these reservoirs, both on the tributaries and in the main stream, there is a storage volume retained above high-pool level to take care of floods at unexpected times. There exists then, in the reservoirs, flood control which is at maximum during January, February, and March, but considerable storage is retained for this purpose alone above the high-pool levels throughout the year. At most of the dams there have been electric power plants installed; in the TVA system it has been economical to install in the tributary reservoirs and, to some extent, in the main-stream reservoirs, more turbines than would correspond to the firm power available. The secondary power is worth a good deal as such. Also, because the TVA power system is interconnected with the power systems around the Valley, it is possible to exchange power. The curse of a steam-electric system is the daily peak load; by carrying some of the daily peak loads in the surrounding systems, the TVA receives in return much larger amounts of power at off-peak times, so that the power which would normally be secondary power from our excess turbines becomes primary power through power exchange. The reservoirs are operated to yield the maximum electric power subject to the condition that navigation must be maintained and the reservoirs must be held at low levels during periods of flood danger. The generation and distribution of electricity at low rates brings benefits both in the cities and on the farms. About 70 percent now of all the farms in the power distribution area of the TVA are now served with electricity, and in some areas the coverage is 90 percent. In modern agriculture, electricity on the farm is as desirable as it is in the city home and, of course, the opportunity for using electricity on the farms is greater than in the ordinary home.

There prevails an idea that we should keep the silt out of the reservoirs; and that, of course, is a good idea. However, most people think that is a good idea for the wrong reason. There is actually room in the dead storage of the reservoirs, i.e., below the lowest drawdown levels, to store all the silt that will wash down from the watershed for the next several hundred years under currently prevailing conditions. This, of course, is not the situation which prevails for reservoirs in some other regions of the country, but it happens to be the case in the Tennessee Valley. But no one wants the silt in the reservoirs, and there are a good many reasons why no one wants it there. In the first place, everyone in the Valley has an interest in agriculture; it is better to have the fertile top soil on the farm, where it belongs, than in the bottom of the reservoirs. Also, the silt washing down

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from the hills to the bottom lands, where it is very seldom needed, is seldom beneficial and is sometimes disadvantageous. Furthermore, the reservoirs supply water for municipalities and industries; and clear water is preferable to muddy water. There are fish that live in the reservoirs, and the reservoirs are used for recreational purposes; there is every reason in the world for TVA, from the standpoint of its reservoirs, to wish the silt kept back where it belongs. Any land use which will tend to reduce soil erosion is looked upon by TVA as being desirable.

There is a complex and dynamic and constantly varying relationship between the watershed and the stream flow. For example, if average rainfall by months be plotted, the curve will show that, starting late in the fall, the rainfall normally increases and reaches a maximum in January, February, and March. Then there is a little letup in April and May. In June and July the rain picks up again, and, statistically, March and July are the wettest months. Then there is a dry period, normally, although, as indicated, any month in the year may be very dry or very wet; but normally a dry period comes late in the summer and lasts until nearly the end of the year. Now, if the average flow of the river by months be plotted, the curve of flow does not correspond to the rainfall. In the late fall, when rainfall increases, the river flow rises. The river continues at high flow, normally, in the January, February, and March period. Then the flow begins to decrease, in spite of the fact that there is a considerable amount of rain in the spring. In June and July when, again, there is high rainfall, the river flow keeps on going down. It is obvious that the watershed is very much more active at some seasons of the year than it is at others; and the watershed is exerting a profound effect on the flow of the river.

I have mentioned that about 42 percent of the rain leaves by the river and 58 percent is evaporated by the watershed. These are average figures for a year, but during the winter months the watershed evaporates less than the 58 percent, whereas during the summer the watershed will evaporate upwards of 90 percent of all the rain that falls. Obviously, land use in watershed has a profound effect on the stream flow.

Let us now consider what happens to rain when it falls on the land. The first thing that happens when rain starts is that the surface of all the vegetation on the watershed gets wet. The vegetation surface acts as a natural reservoir. There are a number of such natural reservoirs operating in the watershed. One of them is that afforded by the vegetation surface. To be sure this natural reservoir on the surface of vegetation is not very deep, but it is a very large area. The total area of all the vegetation that grows on the 40,900 square miles of the watershed is several times the ground area. This reservoir is filled and emptied many times during the year, usually 100 or more times a year. I have tried to make an estimate of the amount of water that flows through each of the natural reservoirs of the watershed. It is difficult to arrive at any satisfactory figure as to the amount of water the natural reservoirs may hold, but the amounts that pass through can be estimated. Of the 51 inches of the average rainfall, I have estimated that about seven and one-half inches annually flow through the vegetation surface reservoir. This particular natural reservoir, then, receives water frequently, stores it for brief periods, and then evaporates it into the air.

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I next set out to estimate how much water is tied up for a period of time in the vegetation itself. The mass of vegetation that is growing on the watershed, particularly in the forests, is enormous, and living vegetable matter contains much water. However, when compared to the water in 51 inches of rainfall, it is insignificant. A small part of the rainfall, only one- or two-tenths of an inch, corresponds to all the water tied up in the billions of tons of living matter on the watershed. The water in this natural reservoir is then negligibly small.

After the rain wets the surface vegetation, it begins to reach the surface of the ground, begins to soak in. The soaking-in process is very important with reference not only to crops but also to the streams. There have been published a great many articles dealing with infiltration and what happens to the water when it gets into the soil, but nearly all of them have been written by people who are concerned with infiltration as it affects growing crops. The TVA is interested, as you folks are, in growing crops. But the TVA has a unique interest in the question of how much of the water will get into the reservoirs. When the water soaks into the soil by this process called infiltration, the soil itself absorbs some of the water and holds it with a certain tension. This water is in the form of films around the soil particles and in films between the soil particles. As those films get thinner, the soil hangs onto that water with a greater tension. A part of the water held in the films, usually called capillary water, is the source from which plants derive their supply of water.

Another part of the infiltrated water passes through the soil by percolation to the underground reservoir. We have here, then, a third and fourth type of natural reservoir, i.e., the soil itself and the underground reservoir. The water which is held in capillary form in the soil never gets into the underground reservoir. It stays in the soil until it is taken up by plants or is evaporated from the surface of the ground. Evaporation from the surface of the ground is not a large part of the water which passes through the soil reservoir. Most of it is taken out of the soil reservoir by the roots of growing plants, carried to the leaves, and evaporated through the cells on the lower sides of the leaves. I have estimated that annually about 22.1 inches of the average total 51 inches of rain go into the soil reservoir and are eventually returned to the atmosphere through evaporation from the surface of the soil to a small extent and by transpiration to a large extent. As to the amount that goes through the underground reservoir annually, my guess is about 10 inches of the total 51 inches. Water that gets into the underground reservoir must, first, pass through the soil; it passes through by virtue of percolation. There are two factors involved, the infiltration rate and the percolation rate. If the soil is below its normal maximum holding capacity, i. e., what is called its field capacity, infiltration rate may be controlling. However, after the soil reaches its maximum holding capacity, then percolation rate becomes the controlling factor. In the summertime, when the soil moisture is normally below field capacity, infiltration rate is likely to be the controlling one. During the wintertime, when there are frequent and long rains, it is very likely that the percolation rate determines whether the water will get into the soil, or whether it will run off over the surface of the soil, because, obviously, percolation cannot take place until the water infiltrates, and, conversely, infiltration can't take place in the soil if there is no place for

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the water to go; so the two processes depend upon each other, and either may be controlling. It is desirable, from the standpoint of the river, anyhow, that both infiltration and percolation conditions be favorable. They both depend, of course, on the type of soil, its tillage, how many root channels there are, and so on. From both the standpoint of agriculture and stream flow, it is desirable to have as much water go into the ground and as little off the surface of the ground as can be arranged. Agriculture and the TVA's special interests in the stream flow are served alike by measures that will put water into the soil instead of having it run off over the surface with consequent danger of soil erosion. When water goes to the underground reservoir, it will come out much more slowly and at a later period than it does when it runs off the surface. A vegetative cover is, of course, desirable from the standpoint of protecting the soil against erosion and in maintaining conditions favorable to infiltration and percolation. So far as the flow of the stream is concerned, it is desirable to have the water coming into the streams underground and not overground, because it comes underground much more regularly and over a delayed period. Anything in large use of farm practices that will prevent erosion, anything that will increase infiltration, anything that will promote percolation, appears to be desirable both from the standpoint of agriculture and streams.

The rivers and streams get their supply of water from both the surface runoff and from the underground runoff. I have estimated the average annual surface runoff as about 10 inches, and the underground flow into the streams as about 11.4 inches. The sum of these two will present the 21.4 inches of the total 51, i.e., about 42 percent of the total average rainfall.

In TVA circles, we have many questions as to the effect of land use on the stream flow. We have a general picture of how much goes in and out of the natural reservoirs on the average. The average figures are not particularly significant, but give a measure of the general situation. The day-to-day, week-to-week, month-to-month, year-to-year situation is much more important; the watershed, which takes, on the average, 58 percent, will take much less or much more than that, depending upon the condition of the watershed at the time. When we have a so-called dry year, say, 25 percent below normal rainfall, the watershed still receives enough rain to produce a fairly luxurious growth of vegetation; so the watershed uses about its normal 30 inches out of the 51, even though the year may be a relatively dry year. That means that the total shortage of rainfall will be reflected in the river flow. Even in a year of normal rainfall, evaporation processes and transpiration are at a high level in summer and the watershed may take 90 percent of the total rain although the annual average is 58 percent of the total.

The TVA has considered the various possible changes in use on the Valley watershed. It is idle to consider what changes in land use might be favorable to river flow without regard to their effect on agriculture. The criterion is that any proposed change in land use must, in the first place, be one that is favorable to agriculture; otherwise, it will not be brought about, because most of the land is in private ownership, and any proposed change in land use must be made by people who own the land; the farmer will not make changes unless he considers them to be to his interest. There is

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going on in the Valley an expansion of the so-called winter pasture program. We have tried to see what that would mean with respect to the reservoirs.

About 54 percent of the total area of the Valley is in forests and woodland, and we have looked at the forests from the standpoint of their economic value in the Valley. We have also studied the effect of the forest on stream flow. No doubt a fire-protected, ungrazed forest offers optimum conditions for water infiltration and percolation. However, these conditions are not had free. The forests are occupying land and the question arises as to whether all the forests are on land where they should be. The TVA is engaged in a forestry program; our Forestry Division has cooperated with the U. S. Forest Service and the States in getting fire protection of the forests and improving the quality of the forests and in getting good forest management; but I do think we have to watch ourselves with respect to planting trees on lands that are potentially useful for other purposes. Already, where the pasture program has overtaken the amount of land available on farms, farmers are clearing off the woodland. Farmers have been doing that for a long time, too often clearing the woodlands without proper provision for taking care of the soil thereafter. That, of course, means loss of the topsoil and has taken a heavy toll of the fertile lands in the South. The woodlands have been cleared and row crops have been planted; in a few years the land has been abandoned. After it has been abandoned, the forest that grows up is likely to be of scrub type that is not very useful as forest and is not very useful for any other purpose. In our enthusiasm for forestry, we do have to watch out that we are not planting trees on land that should, and eventually will be, in much more profitable use. On the other hand, it is desirable to make the best use we can of our forests and woodlands, to protect them, and to get areas that are not suitable for agricultural use into forest. Our Forestry Division is working in close cooperation with the extension agents in the field in getting trees planted where they should be planted and not planted where they should not be planted. It is desirable to take into account the changes in agricultural techniques that have come about here in the South and, I suppose, elsewhere, in the growing of pastures on land that formerly were thought suitable only for forest. On dozens of farms there are today fine pastures of orchard grass and Ladino clover growing on hill-sides so steep that until recently there seemed to be no chance of getting grass sod established. I was on a farm the other day where they were getting that done, and I said to the farmer, "Wouldn't it be desirable to put in some contour furrows around this hillside"? and he said, "From my standpoint, there are two difficulties there. In the first place, I don't own a plow; and in the second place, I don't own a horse, and the hill is too steep for my tractor." In the Valley we now have splendid pastures on some very steep hill slopes, and that needs to be taken into account when we talk about reforestation.

The best place to get information on the relationship of the forests to the stream flow is at the Coweta Experimental Forest, of the U. S. Forest Service. They took a subwatershed in the Coweta Basin and cut down all the trees and just let them lie there. In that way, they protected the soil by keeping the forest litter, for the time being, at least; what they did

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do was to cut off transpiration. There was an increase of 65 percent in water yield in the streams. I took those figures and applied them to the Douglas watershed and I found that if all the forested land of the watershed were cleared the increase in electric power would be worth about 3,900,000 dollars a year. Of course, the study was academic because the Douglas watershed is not going to be cleared. Part of it is a national forest, to begin with and, further, I don't think TVA is ready to recommend any such moving in on the forests as that. I do point out that whereas the forests have a place in the picture and they are a source of income, they cost something in water yield. The forest transpiration, at Coweta anyhow, corresponds to about 17 inches of rain. Put that rain in the reservoir and it is worth about 3,900,000 dollars in power.

We have the problem of adjusting agriculture with forestry, and the question is where to plant and where not to plant trees. The changeover to a pasture program, so far as its effect on agriculture is concerned, now seems to be pretty well settled. It is generally agreed that it is a desirable program from the standpoint of agriculture. It protects the soil and takes advantage of the moderate climate here; the South should be the winter-grazing area of the country, coordinated with the summer-grazing areas of other parts of the country. It is possible in this area to get the lambs to the market and the calves to the market in spring, and to stabilize the milk production.

The TVA is interested chiefly in what the winter pasture program might mean in respect to river flow. One effect of changing from summer-growing crops to the so-called winter, or winter-spring, growing crops, so far as stream flow is concerned, is to shift the period of maximum transpiration. Data on a crop of winter oats on a University of Tennessee field indicate that up to December 1, the oats made a sixth of its growth. There isn't any exact relationship between growth and quantity of water transpired, but there is a rough one. Transpiration is controlled both by the structure of the plant and by the ordinary factors that control evaporation, such as temperature, wind velocity, and moisture gradient. Up to December 1, the oats made about a sixth of its growth; from December 1 to March 15, it made about a third; and it made the other half of its growth up to the time it was harvested about the first of June. I have tried to apply data such as these to the open farm land of the Douglas watershed. In order to get a measure of what change in land use might be brought about, the data from 39 test-demonstration farms were studied. The shifts in land use that had been made on these 39 test-demonstration farms were then applied to the whole Douglas watershed that is in open farm land. Apparently there are some 415,000 acres that may some day be shifted from summer-growing to winter-spring-growing crops. That would bring the total of pasture lands up to about 650,000 acres. The difficulty of figuring how much a shift in land use would mean in terms of electric power in the reservoir comes from the facts that are characteristic of the reservoir and the way in which the reservoir is operated. During the January-February-March period, water is often spilled, in spite of the fact that there are more turbines available than can be used in primary power production. Water that is spilled will not generate power. Any use the vegetation can make of the water during the period when normally it will be spilled is to the good. Water that goes into the ground during the January-February-March period and comes into the reservoir after March 15, when rapid filling of the reservoir is desired, is also a gain. Any water not spilled can generate at least secondary power, and if the shift in the transpiration period will delay the delivery of water from the rains of early

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spring, the amount of primary power generated at Douglas can be increased. In general, we know that the change in period of maximum transpiration would benefit the reservoirs, and the increased revenue from power production might amount to some hundreds of thousands of dollars, but it is difficult to make an estimate in quantitative terms. It is difficult because we do not have enough field information. Most of the published data have been with respect to crop growing on the land and not with respect to yield of water from the watershed.

There is another proposal to which we have given thought, namely, that of contour plowing. There has been a good deal of work done in terracing and in contour plowing, but these data, for the most part, refer to terraces that are fairly far apart, some 30 to 40 feet apart, depending upon the slope. In the data on contour plowing, the furrows were usually some two or three feet apart. It has been suggested that the furrows be close-spaced, giving the field a washboard pattern of ridges. I have derived a formula indicating how many inches of rain the furrows would retain if they were r inches deep, m inches apart, and the slope was s . The formula predicts results that seem to be too promising. There is something cock-eyed about it because if the furrows were as effective as they appear to be from the calculation, they should hold practically all the rain that falls. The formula is: Q (inch of rain retained) = $\frac{200r - ms}{200r + ms}$. For furrows 6 inches deep and 24 inches apart, the water retained would be 3 inches on level land, 2 inches on a 10 percent slope, and 1 inch on a 25 percent slope.

Surface runoff occurs whenever the rate of rainfall exceeds the rate of infiltration. Rains that come in the wintertime are usually quite different from those which come in the summertime. The characteristic winter rain is one that starts off slowly and continues for a long period, with an occasional burst of intensive rainfall. In the summertime, the rain usually starts with a sudden burst and then the rate of rainfall falls off. A study of the雨 gage record at Blue Ridge in the Douglas watershed indicates that there would be few occasions when there would ever be any surface runoff from a pasture furrowed in the washboard pattern. In January, February, March, and April of 1946, there was only one storm in each month that exceeded one inch. Taking into account the infiltration that would occur during the storms, it would appear that the proposed furrows would have prevented surface runoff from pasture lands in the January-April period. There were three rains in July which exceeded one inch, and on 10 percent slopes even these would not have caused surface runoff. These predicted results look too good to be trusted.

There is, of course, nothing new about contour plowing. What looks good is the apparent capacity of close-spaced furrows to hold water, thus increasing the time allowed for infiltration regardless of the rate of infiltration. It looks as though it would be a very effective means of getting water into the ground. Again, we lack field information on large enough fields to get reliable data and, particularly, on fields that are grazed by animals so that data may be had as to how the furrows stand up and what the actual increase in underground water yield there may be. Presumably, getting more water into the ground would be favorable to crop production, and most of the published data on contour plowing refer to this phase of the problem rather than to any change in water runoff.

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I have tried to present the general picture of what effect there might be on the streams following changes in land use which would meet the criterion of being acceptable or favorable to agriculture. More data are needed on the prevailing set-up. TVA is now planning to concentrate its attention on sub-watershed and small problem areas. Again, I come back to saying that what happens on the land affects the river, and what happens on the river is of interest not only to the people of the cities but also the people who live on the land.

RELATION OF TENNESSEE VALLEY WATERSHED
TO ITS STREAMS: DISCUSSION

by
R. E. McArdle^{7/}
 Assistant Chief, Forest Service

While you were talking this morning, Dr. Curtis, I was stimulated to write some things down; and here they are. I think what we are all talking about here is what is best for the entire Valley. Don't you agree that that is about what we have in mind? What can we do in all of our respective jobs that will be of most benefit to the entire Valley? I got that from Dr. Curtis' talk very definitely. I also got from his discussion that TVA was especially concerned with water because of its power, flood control, and navigation aspects; but we are also interested in the land in the Valley because of its relationships to the water, the amount of water, the quality of that water, whether or not it is usable, and the regularity with which that water is received in the stream channels.

There are a lot of agencies working in the Valley that are perhaps more concerned with food and fibre production than with water production. Maybe a better way to put the matter is to say that all agencies should be concerned both with food and fibre and with water production; and I got very definitely from Director Curtis' talk that he would like to see us move in the direction, not of food and fibre production alone or of water production alone, but the two together, taking into account the practical considerations of how you can do that or where you can do that. I think there is a tie here of benefit to both groups.

It has been six years now since I was stationed over at Asheville as director of that forest experiment station; and it seems awfully good to get back and hear some of the lingo that we used to throw around. I have forgotten most of the terms, Dr. Curtis. I tried to think, as you were talking, of the names of the chart we used, the stream hydrograph, but I have lost touch with a great many of the technical terms. I am one of those people, Dr. Curtis, chiefly responsible for the inequities and damages done to that Coweta watershed. When I came there, it had been merely measured in its natural condition for a good many years. I was anxious to see something happen there. I wanted to

7/ See text, p. 23.

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see what would happen if we did certain things, because I wanted to reach the next step, which was the application of what knowledge we obtained. I gather that is exactly what we are talking about here today. Those fellows over there selected that area with certain definite things in mind. They wanted an area with heavy rainfall. There was not much point in spending a lot of money in experimentation where they get a few storms a year. They wanted many storms so they would have a lot of data quickly. They wanted certain forest conditions which would be applicable over much of that part of the region. And they wanted deep soils because they wanted to get into some of the fundamentals. They wanted to be able to trace as far as they could the complete hydrologic cycle which Dr. Curtis described to us here this morning.

We found that we were better able to do that at Coweta than at some of the other forested areas in which the soils were shallow. How successful we were, I don't know, because I haven't been back to Coweta since I left there ten years ago. But I do know that the results which were obtained at Coweta ought to be very useful for the type of thing we are talking about here this morning, because I don't think we are talking about repeating a lot of fundamental research. I think we are talking about testing the application of what we already know, at least in a large measure. Now, I got that from your address this morning, and if I am wrong, I should be corrected. If your talk headed me in any direction, it headed me in the direction of not engaging in a lot of fundamental research, although I think that is involved also, but specifically of trying out in the Valley, elsewhere in the Valley, because Coweta is in the Valley, some of the things we found out there and some of the things we found out at other places in the Valley that TVA folks have done, Fry and others, somewhat along these same lines. Perhaps there is information available elsewhere in the United States which could be tried here. It may not be applicable, but we could test it.

To achieve the finer cooperation that I think Dr. Curtis was urging upon us, it seems to me, will require, first, a thorough examination of the objectives that we have in mind and the problems that we are going to have in reaching them. To illustrate what I am talking about, I think one of the first things that would be needed, Director Curtis, is an inventory of the land areas in the Valley, from a water resource standpoint. It may be that that has already been done. I have been away for so long that I haven't kept in touch, but I would think that that would be one of the first things that we would want to do: to make a study immediately, I should think, of the whole area of the Valley from the standpoint of the water resource itself. Where are the high-yield areas, the low-yield areas, from the standpoint of water load? Where are the areas that are especially susceptible to local floods? If we can get anything on groundwater conditions, put that in. I am not trying to give a complete working plan here, but just indicate some of the basic knowledge that I think is needed. Then I think these areas should be classified in terms of their critical importance from the water resource standpoint again; and on these critical areas (we wouldn't take areas of no importance from the water standpoint, but we would concentrate on areas of true, critical importance) we would try these other things that Dr. Curtis is talking about: different methods of farm management, how they affect the water yield.

I may be reading into what he said some things he didn't intend, so I hope he will correct me. I am just telling you the effect of the vibrations that

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I got this morning. We could try, for example, some of Mac's (Mr. McAmis') washboard plowing; we could try different types of treatment of the forest; we could try different types of pasturing. I don't mean the different types of vegetation on the pasture, but the way you handle the stock on the pasture, perhaps the fertilization of the pasture, and all the other things that go into the land-management aspect. I think we have got to keep our eye on this type of thing qualitatively as well as quantitatively. I am just throwing that in on the side, but it is worth very much more than just a remark on the side. I think we have to watch that we keep our thoughts straight as to whether we are measuring natural conditions, or whether we are aiming at conditions under management. I mention that definitely because at Coweta we had in mind measuring natural conditions first and then farm management. The question might be, do we want to go through all that process over here or start with the management end. If you start with the natural conditions, it will take very much longer.

I should like to refer to one of the things that was brought out in our discussion, following the talk this morning, which I think is of considerable importance. In the area which was completely cut over at Coweta experimental forest, we were very careful not to disturb the litter on the ground, the ground cover, because of the tremendous importance of that spongy layer in getting the water into the soil. Had that area been burned--we burned an area over there, too--that would have destroyed that filter on top of the ground; and instead of so much of the water going into the ground, the water would have been muddy; it would have clogged up the soil pores and thus have increased the runoff on top of the ground. I think I am correct in that.

What I get out of this is that we don't want to give all of our attention to the water problem. We want to bring the two, water, food and fibre production--water is a crop, too--we want to bring the two together. If I got the gist of this correctly, it would be a mistake, I think, to consider water yield only. The ultimate treatment that we get is somewhat of a compromise. As Dr. Curtis has indicated, that compromise is weighted very heavily in favor of the production of food and fibre. That is true for the natural conditions, because the vegetation will take it anyway, but it is also true when you are talking about changing a treatment of the land in order to get more water, better water, and a more regular flow of water. You have got to deal with the people that own that land. They are not interested in producing water, because they don't get any money for the water. They are interested in what money they can get from food and fibre.

What we would wind up with would, perhaps, be expressed in terms (1) of what would be best from the angle of food and fibre production in relation to the production of water; and, expressed also, in terms (2) of what we think we can get. If we could get agreement on what we wanted to work toward in terms of land management so as to produce the best results in food and fibre and the best results in water, all agencies, I gather, would work toward the same end. We might not be able to get there at once. We might not be able to persuade the owners of the land to do those things, but if all of us were aimed in the same direction, we would have a lot better chance of getting there than otherwise. I get that that was what Dr. Curtis was asking us to consider. If I have misconstrued his aims, I hope he will make the necessary corrections.

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I want to add one thought before I sit down. It illustrates, I think, the importance of this point of fitting these things together.

Mention was made of 4 million dollars of electricity which could be gotten (if this proposal were possible to get this result) from taking all the trees off a particular area. Dr. Curtis realized, and he tried to impress upon us, the practical dangers of trying to take, for example, an area of 108 inches of rainfall, with deep soils with perhaps a little different forest type, and then to apply results from that area generally. I have made a rough calculation here, and Bill Baker better check this one for me, but the returns from this particular area that was mentioned was about one-seventh of the total forest area in the Valley. The returns from forestry in the Valley are around 200 million dollars a year, so that one-seventh of that would be about 28 million dollars from wood products. However, I think that includes rather heavily the value of finished products, and maybe that isn't a fair way to do it, so just take the value of the timber that is cut in the Valley now, which is about 50 million dollars a year, one-seventh of that is about 7 million dollars a year. I gather from the last trip in which I was over in that area that it could produce a lot more wood than that, perhaps three times that much, so that if I were making some guesses, I would say that from wood in that area maybe we could get 15 million dollars or 20 million dollars, just from raising wood; so we can get a lot of valuable water, get a lot of valuable pastures, and get a lot of valuable other things. We have to fit these things together so that we can get the most of all of them. I think that is just what he was talking about and asking us to see: settle on the objectives to see if we couldn't focus on the problems that might be encountered in reaching those objectives.

I believe that we are all going to try to work in the same direction and try to do the necessary experimentation to overcome this problem. It is extremely refreshing to me, as a forester, who, traditionally, have been in arguments with engineers for a long time, to hear Director Curtis this morning. I don't know when I have been so encouraged as a forester, as long away from being through the woods as I may be, as I have been this morning, Dr. Curtis. I haven't heard any engineer at any time talk so intelligently on the vegetative aspects of this thing as you have; and foresters have customarily gotten out of their depth in getting over to the engineering field. If we could speak in engineering terms as capably as you have in forestry terms this morning, I think we could get together a whole lot better.

LOOKING BACKWARD AND FORWARD

by
 John R. Hutcheson^{8/}
 Chancellor, Virginia Polytechnic Institute

My understanding is that you have invited me here today to tell you what I think of the joint TVA-Land-Grant College program of agricultural development

8/ See text, p. 24.

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in the Tennessee Valley watershed. I am not particularly concerned that you agree with anything that I say. I am not here in any official capacity. So far as administrative authority is concerned, I don't represent any party to the contract. I am foot loose and fancy free, and plan to conduct myself accordingly. I shall be more than satisfied if what I say causes even one person to think more constructively regarding some of the problems with which we in this Valley and in this Nation are now confronted.

It has been my privilege to have been rather closely associated with every land-use and agricultural development program launched by the Federal Government during the last 40 years. During this period I have served as an agronomy research worker, a teacher of vocational agriculture, an extension live-stock specialist, a State director of agricultural extension, a land-grant college president, a college chancellor, and a dirt farmer. I have also seen service as a member of the National Land-Use Planning Committee, the National Extension War-Time Advisory Committee, and the National Land-Grant College Committee on Postwar Agricultural Policies.

In those several capacities I have travelled at least 30,000 miles per year, most of which has been in the rural areas of Virginia and the South. This travel and these contacts have provided ample opportunity for me to observe and evaluate the effectiveness of the various agricultural development programs now in operation in this Nation. With no thought of trying to gain favor with those here assembled, I say unhesitatingly that during the last quarter century I know of no land-use program in this Nation which has secured as great results for funds expended as has the joint program of agricultural development carried on by the Tennessee Valley Authority, the U. S. Department of Agriculture, and the State land-grant colleges of the Tennessee Valley watershed.

Tribute to Dr. Morgan

Emerson, I believe it was, who said, "An institution is the lengthened shadow of one man." Carlyle went one step further and said, "The history of this world is but the biography of great men." There are those who would argue as to the accuracy of these observations, but I am sure that most of us agree that men of great vision and leadership are essential to the success of any educational program. The Tennessee Valley program of agricultural development has been blessed with a number of such men. But in my opinion, in this program, one man has stood out above all the rest. That man was our beloved friend, the late Dr. Harcourt A. Morgan. His leadership is measured by his fellowship.

Since some members of this group were not privileged to have been closely associated with Dr. Morgan, I want to describe to you briefly some of the things which I think made him a great leader, especially qualified for service as a member of the Board of Directors of the Tennessee Valley Authority.

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Dr. Morgan had a vast and intimate knowledge of the Tennessee Valley area, its resources, and its people. For more than 50 years he had been going up and down the Valley with maps and charts, meeting farmers informally in their homes, in their fields, and in lecture halls. He had the rare ability of learning something from each new person and new situation he encountered.

Dr. Morgan was a man of broad scientific training and experience. As biologist and entomologist for the Louisiana State Experiment Station, he helped establish the scientific design of southern agriculture's long and successful fight against the cattle tick and the cotton boll weevil. His training as an agricultural scientist was so broad that he was rarely stumped in technical discussions in any field in which TVA dealt, from hydraulics to electronics.

Dr. Morgan was a man of great vision. He not only saw the soils, the minerals, the streams, the crops, and the animals of his beloved Valley, but he visualized how those material things could be used in building a great civilization. He worked closely with the late Senator Norris to make sure that the pattern for industrial development that was certain to grow out of TVA's power-generating activities should be decentralized. He saw factories within the countryside and sought to preserve the benefits of a rural way of life for the Valley.

Dr. Morgan was a man of great courage. His physical courage enabled him once to face a mass meeting of Florida citrus growers outraged at the prospect that their groves must be burned to isolate the fruit fly. The fact that this mass meeting threatened to turn into a lynching party, with him as its intended victim, did not deter him from insisting upon what he thought was the right course of action. In addition to physical courage, Dr. Morgan possessed unusual moral courage. He knew that the smart thing to do was always the right thing. He did not jump at conclusions, but when he thought he was right, he never hesitated.

Dr. Morgan was a great soul. One editor, in paying tribute to him, said, "He believed that the laws of nature are the laws of God, and that the lines of those laws have gone out through all the earth and their words to the end of the world. He believed that since man is endowed by his Creator with leadership and control, it becomes his duty to discover and use those laws for the benefit of mankind and for the glory of God."

I could enumerate many other qualities of true greatness in Dr. Morgan, but time will not permit. We in the Valley are indeed fortunate to have had the benefit of his experience, vision, and wisdom in the early years of our joint program. I like to believe that God has something for men like Dr. Morgan to do "Over There," and that he is now taking orders from the Captain of his Salvation. I know that a measure of his spirit still lives among many who were associated with him.

TVA Given Unique Responsibility

From what has taken place in this region during the last few years, I know that there is considerable difference of opinion as to just what responsibilities

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Congress meant to assign the Tennessee Valley Authority when the legislation creating the Authority was enacted. I shall not attempt to debate this question, but would like to outline briefly my own conception of this responsibility.

I have always had the idea that Congress intended to establish in the Tennessee River Valley a unique demonstration of how a large river and its tributaries can be harnessed in interest of national defense, flood control, power development, watershed protection, and regional development. I have also had the idea that Congress expected the Authority in setting up and carrying out this demonstration to utilize and coordinate the activities of various State and Federal agencies conducting programs with similar objectives. The purpose of this demonstration was to conserve and develop the natural and human resources of this Valley so that they would make maximum contribution to a better way of life, not only for the people who live in the Tennessee Valley, but for all citizens of the Nation and the world.

My conception is probably too limited to suit some of you and too comprehensive to suit others. However, I take it that it is necessary that you know my viewpoint if what I say is to have any value. When you asked me to appear on this program, I understood that you wanted me to discuss frankly what I considered some of the strong points of the program, some of its weaknesses, and then to suggest how I think the various parties to the agreement can cooperate more effectively in the years ahead. Since most of my observations and experiences with the Tennessee Valley Authority have been in connection with our joint agricultural development and watershed protection programs, I shall confine my remarks to those fields.

Some Elements of Strength

In my opinion the success of our joint efforts in the fields of watershed protection and agricultural development has resulted from the following things:

1. The program has been truly cooperative
2. Time-tested procedures have been followed
3. The program has been a "grass roots" program

Fortunately, Dr. Morgan and his associates realized that other State and Federal agencies had been assigned somewhat similar responsibilities and that the experiment stations and extension services of the U. S. Department of Agriculture and the land-grant colleges had accumulated vast funds of information and much valuable experience in taking such information to farmers. They knew that these agencies had already earned the confidence of thousands of farmers throughout the Tennessee Valley. Therefore, when they approached the representatives of those agencies they did not come with a set program and predetermined procedures. Instead, they explained to us their conception of the job which had been assigned them and asked what we thought were the best methods and procedures to follow in accomplishing the desired ends. This plan of action was smart because it was right. It is the only known way of securing real cooperation.

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Frankly, we at Virginia's land-grant college were flattered when they made this approach to us. We gave them everything we had. My brother, the late Dean T. B. Hutcheson, told them that we had been conducting research with pasture fertilization for more than a quarter century and that we knew that the application of phosphates and other fertilizers would thicken sods and that thick sods are one of the best methods of preventing erosion on Southwest Virginia hillsides.

They then asked us why more farmers were not following this proven practice. We replied, "Because most farmers learn more rapidly by seeing and doing than by the written or spoken word." Thirty years' experience had taught us that demonstrations on the farmer's own farm was the most effective teaching device. Now, Dr. Morgan and many of his associates already knew this, but they were smart enough to let us tell them instead of telling us. This was intelligent cooperation.

Similar approaches were made to land-grant colleges in other Valley States and, as a result, a truly "grass root" program was developed. Dr. Morgan knew of the phosphate deposits in the Tennessee Valley. He knew that most of the Valley soils were deficient in phosphates. He knew that the TVA had fertilizer manufacturing plants and that it had been given a mandate to develop new materials and new uses for those materials. He also knew that one of the jobs of the TVA was to put this knowledge to work in interest of watershed protection, flood control, and sound agricultural development.

Dr. Morgan and his associates went to the land-grant colleges of the Valley States for assistance because they knew of these colleges' research facilities, their adult education programs, and their reputation for conducting educational programs at low cost. They also knew that those institutions had long-standing agreements with the U. S. Department of Agriculture for cooperative research and extension teaching. They, therefore, decided that it was just good sense and good business to supplement rather than duplicate the cooperative land-use and agricultural developments of the land-grant colleges and the United States Department of Agriculture.

Most of you know how this program has progressed. From plot demonstrations, to farm unit demonstrations, to community demonstrations, to areas. Time will not permit my discussing details. However, I am personally convinced that during this last decade greater progress has been made in pasture fertilization, land-use adjustment, livestock development, and home improvement in the nine Valley counties of Virginia than in any like-sized area in the State. I am also convinced that the progress made to date is but a drop in the bucket compared to what can be accomplished during the next decade if we will continue to cooperate, profit by our mistakes, and raise our sights to new horizons.

Some Weaknesses

If we are to profit by our mistakes we must recognize them, admit them, and correct them. Some of you may not agree with some of the things that I am now going to say. This will in no way offend me. In saying them, I may be simply confessing my own shortcomings. I hope that this is true. I fear that it is not.

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From the beginning of this joint undertaking there have been too few Harcourt Morgans and too many John Does. Too few of us have been thinking of the Valley and its people and too many primarily concerned with their own particular segment of the undertaking. We have been working busily as engineers, agronomists, economists, sociologists, administrators, research workers, and extension workers rather than pulling together as a team. This is human and natural. It is so much easier to criticize others, even our friends, than it is to search our own souls and lose ourselves in service.

My short term as president of one of the Valley's land-grant colleges convinced me that the average college president in this region did not know enough about our joint program to successfully evaluate it. We were so busy with so many things that we often did not take time even to attend annual meetings. We were still inclined to look on the undertaking as their program rather than our program. Unfortunately, some experiment station and extension directors seemed to feel the same way about the matter.

I am not a research worker and am, therefore, not in position to intelligently evaluate our joint research program. However, I have sometimes had the feeling that our research people are still thinking too much in terms of test tube and plot measurements rather than in terms of farms, communities, and areas. I knew that some of our extension workers have followed this line of thinking. As a former extension director, I confess that I was sometimes inclined to give too much time to thinking about how much money I could get out of the TVA to strengthen Virginia's extension program and too little to the broad objectives of our joint undertaking. This, too, is human, but some philosopher once said, "Human nature is just damn meanness."

Since I have never served as an employee or official of the TVA, I am not qualified to criticize intelligently its interior operations. But from the outside looking in, I have sometimes felt that it, too, might profit from closer co-ordination and teamwork. I have also felt that it would be a good thing for the whole TVA program if its high officials spent more time in the field. The TVA program is bound to lose vitality if it loses its "grass roots" touch.

For the past few years I have not been very closely associated with our joint program, but I have somehow gained the impression that administrative officials of the TVA have not been as careful in developing details of new programs as in the early years. There seems to be a growing tendency to confer with farmers, extension workers, and research workers after decisions have been made rather than before. I hope that these observations are not correct, but if there is even a small tendency in this direction it should be checked.

One additional observation, and I am through. In looking back over forty years' experience working with farm people, I am forced to the conclusion that I have sometimes been prone to place emphasis in the wrong place. I have been inclined to think of better soils, better crops, better livestock, and better homes as ends rather than the means. I have sometimes forgotten that people and communities and states and regions have souls as well as bodies. Some recent experiences have convinced me that "things of the spirit are truly mightier than things of the flesh." I hope that none of us will ever forget this important truth. I somehow have the feeling that it is more important for us to teach

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residents of the Valley to live together in peace and harmony with themselves and the world than it is to teach them the secrets of atomic fission.

In planning the future development of our joint program, let me express the hope that we may be able to hold fast to that which is good--"Come back to the moorings"--; but at the same time let me express the additional hope that we may be able to enlarge our vision, raise our sights and "press toward the mark for the prize of our high calling."

THE JOB AHEAD IN WATERSHED DEVELOPMENT

by
 Willis M. Baker^{9/}
 Director, Division of Forestry Relations
 Tennessee Valley Authority

Within the Tennessee River watershed, projects of water control and utilization have received major emphasis ever since Congress authorized the Valley program more than 17 years ago. These projects have included not only the construction of dams for river control and of hydroelectric facilities, but also measures of resource development and land-use adjustment involved in water control on the land, such as the test-demonstration farms, reforestation for erosion control, and others.

During this period the most spectacular and measurable progress has been made in the control and use of water resources within the channels of the main river and its major tributaries. This has been essentially a direct action program by TVA. Related projects of watershed protection and management have necessarily been more exploratory and educational, and therefore considerably less intensive and concentrated, because the achievement of ultimate objectives was so largely dependent upon the voluntary cooperation and active participation of people, their organizations, institutions, and many agencies of government at several levels. This relatively slower progress through demonstration projects scattered over the entire watershed was anticipated from the beginning. After a long period of resource exploitation it takes time for people to reorient their thinking and adjust to practices of restoration and development.

Even so, much encouraging progress has been made in the region's use of its farm and forest lands and resources, in industrial and recreational developments, and in many other phases of watershed management. Many of the Valley's problems and opportunities have been identified, and valuable experience has been gained in methods of meeting them. Public understanding of their importance to local, regional, and national economy has advanced. Demonstrations throughout the Valley have led to increased appreciation of the need for integrated activities, and for full participation by all concerned. Effective methods of cooperation are developing to the point where all can work together harmoniously and efficiently in meeting their respective responsibilities.

9/ See text, p. 27.

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The public's changing attitude toward its land and water resources is also shown by the growing financial support of many of the state and local agencies. Their funds, manpower, and other facilities have been greatly increased in recent years, and most agencies are now in better position to render more and better services than they were when the Valley program started.

In many sections of the Valley there is evidence that the people are aware of the need for increased local action. Many are ready to do their part, and they are anxious to get going. In fact, in some instances the readiness of the people appears to be well ahead of that of the public agencies which should be providing leadership. In one respect, at least, this is good, because as efforts toward development are intensified, the local people concerned must take an increasingly active part in the work, and a corresponding portion of the expense. After all, they are the chief beneficiaries.

The progress and momentum developed in the Tennessee Valley program to date now permit a greater selectivity in the activities which should be intensified and concentrated in areas where problems and opportunities are most in need of increased attention. Many such areas occur within the Valley's small tributary watersheds where important local problems of flooding and drainage, stream pollution, public health, erosion and siltation are inseparably associated with opportunities for improved farming practices and better land use; reforestation, forest management, protection, and utilization; industrial development, community planning, and many other measures of social and economic importance. In the aggregate these local problems and opportunities add up to the most urgent needs of the Tennessee Valley for good watershed management and progressive development.

Consequently, the TVA now proposes an intensified program of tributary watershed development with emphasis on integration of activities within critical problem areas. The colleges and other state and local agencies working with TVA have already assisted farmers and landowners in these areas in programs of better land use and resource development. Intensification of these measures within small watersheds should give the several agencies a more effective way to speed up the process of optimum land and water use and general improvement of these areas.

This will provide full opportunity for all of the people and community agencies within a selected locality to work together for the optimum development of a problem watershed. Under such a program important "pilot plant" projects can effectively demonstrate and measure the benefits of well-organized cooperative action. Selected watersheds should be small enough to permit accurate evaluation of the results of program integration, yet large enough to enlist widespread cooperative action, and to have significant application to other parts of the Valley. Preliminary work is now under way in the 85,000-acre watershed of Chestee Creek in southeastern Tennessee, and several others have been given tentative consideration.

Intensified activities of watershed development will inevitably focus increased attention on the need for more and better information of many kinds, and especially on water-land use relationships. Improved land use adjustments should

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be based not only upon knowledge of their immediate effect on landowner income and local economy, but also upon knowledge of their effect on the continued productivity of the land and on the optimum use of land and water resources. There will be need for hydrologic research, studies of improved cropping and land use practices and better utilization of resources, intensive investigations of social and economic conditions and opportunities for development, and bench-mark surveys from which progress of many kinds can be measured. The program anticipates intensification of research as well as of action.

The success of this entire undertaking depends chiefly upon the active participation of the people within a watershed. They will be expected to carry an appropriate share of the work in proportion to their interests, responsibilities, and benefits. The same is anticipated of all cooperating organizations--local, state, and federal. Program participation should start with the planning phases and continue through the action stages of the program.

TVA expects to contribute to the initiation, organization, and operation of watershed projects in accordance with established cooperative policies and procedures. The Authority's production of fertilizer materials and forest tree seedlings should continue to be of material help in the development of watersheds. Various technical skills and much factual information will be available as needed. It is anticipated that other federal agencies operating in the Valley will also participate in accordance with their interests, functions, and funds. However, we should not close our eyes to the probability that the national defense emergency may result in further reductions in federal appropriations, including those of TVA.

In this event it is believed that the Tennessee Valley region is now equipped to carry on essential local work with less federal assistance. Much progress has been made since 1933. Great dams have been built, an unruly river has been controlled, a vast electric power system has been developed, and improved fertilizers have been produced and put to work. There have been significant advances in other fields and many new facilities are now available. But only a start has been made toward full organization of cooperative effort needed to enlist the most effective participation of all people and agencies in a comprehensive program of regional development. TVA believes that pilot-plant projects of tributary watershed development are now urgently needed to advance this most significant contribution of the Tennessee Valley program.

RELATION OF TENNESSEE VALLEY WATERSHED
TO ITS STREAMS: DISCUSSION

By
C. E. Brehm^{10/}
President, University of Tennessee

Chairman Cooper (introducing President Brehm): I am sure that it is unnecessary for me to attempt to present the President of the University of Tennessee

10/ See text, p. 28.

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to this group because, through the years, we have cooperated with him, and he has cooperated with us. He has led many of our enterprises that have been developed, not only in Tennessee, but also in relationship to the work that has been done here, and with our land-grant colleges as a whole. This has been my first opportunity of presenting you, President Brehm, and I am glad to have that opportunity. You, of course, know the audience; and we look forward to your comments.

President Brehm: Dean, you have always been very kind and gracious in your introductions. You certainly have been wonderfully kind to me over those 40 years.

I think this subject has really been rather well covered, and there isn't much further contribution that I can make to it. I was rather profoundly impressed with the fine statement that Dr. Curtis made this morning. There is, in this relationship of water to land use and to people, still a lot to be learned. In your statement this morning, Dr. Curtis, I didn't think you emphasized enough its relationship to people. There is a relationship between people, water, and land. Those are the economic, social, and recreational relationships. I think we are agreed on that. Involved here are the relationships of water to land, of land to crops, of crops to good farm management, and of good farm management to the home and to a good standard of living in the home. Then there are the broader relationships of water and land use to the right kinds of communities, which involve school and church and all those other activities that go to make up the entire community life.

I have had that feeling for a good many years that not only our research work, but our agricultural extension work, and the work of these other agencies, both Federal and State, certainly has reached the point of education and research when we should be approaching these problems on the whole front; not individual problems, as we have in the past, in agriculture, home economics, and land use, from a more or less detached, independent point of view, but I think that our approach should be from the entire community and that we ought to deal with all the factors required to make the best type of life that it is possible to make in that community.

As I listened to these discussions here, my mind went back to 1935 and 1936 when we, in the Agricultural Extension Service, of the College of Agriculture, had, about 20 or 25 miles from here, in the Wheat Community, one of the best community programs, which involved land use and the conservation of water. It was really going good, until the Atomic Energy Commission took over the area. That was the end of the project. In that project, we endeavored to take this unit test-demonstration farm program, which has done so much, and, applying the principles of that program, get every farm home in that particular community and watershed to cooperatively enter into the same type of program on each farm. I do not know of any other project that we have undertaken that has had the enthusiastic support and leadership, and the cooperation, which that particular project had. In reality, the whole objective was to develop better homes and better farms in that watershed, in that community, and, at the same time, bring about the objectives which the Tennessee Valley Authority was striving for and which Dr. Curtis described so well this morning. Now, no one appreciates more than I the great contribution that the unit test-

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demonstration farm program has made in bringing about a shift from row crops to grass; with the grass comes livestock, and along with that has come, of course, better living in the homes. One of the greatest contribution that has been made to that is electricity. You get a cycle there; many things which are interrelated.

Education, however, is a cumulative thing. There are different levels of people to educate, and that is particularly true of agricultural extension. We always have the elementary group to educate; but in extension work, especially, teaching must be adjusted to the level of education. The thing about extension education is that it is a cumulative thing; and certain generations you bring along cumulatively. You can't continue to teach the same individual the same thing over a period of 20 years or approach the same problem over a period of 20 years in the same way.

I don't by that mean that we have dropped the idea of the unit test-demonstration farm program on each individual farm, but I do say that we should be working in the various watersheds that comprise the Tennessee Valley; that we should be defining those watersheds. After all, people live in them, and they are going to continue to live in them, and we want them to; and there are going to be forests there, and there are going to be farm lands there. A big part of the area is going to be in the farms of the individual farm people who live there. These people on the farms are going to have to make a living. As has been expressed here, probably we should be making a survey and a study of some of these watersheds; defining them; determining the number of families that are in them. I wish that we could study the soil types, the slopes, what the problems are; and then I think we should approach from a community standpoint, across the whole front, those problems that confront the community, rather than those that pertain merely to the individual farm. I think that is the point, in these watersheds particularly, to which the unit test-demonstration farm program has progressed at this particular time.

Now, I realize this, too, to take on a community, approaching the things we are talking about here, involves a great deal of work, both preliminary surveys and studies of the type of agriculture that is adapted to that area, the forestry problem, and then your home problems, your social problems, and so on. The background is going to have to be gotten. But, as I see it, that is the only way anything is going to be accomplished. It is along the line that Dr. Curtis is talking about. After all, water doesn't confine itself to any farm pegs or any boundaries, does it? Take, for example, a flash flood; a slope can involve the whole community. In one of these heavy rains that Dr. Curtis is talking about on a slope, you know and I know that it doesn't stop at fence lines. The fact of the matter is that one individual's lack of care may be just ruinous to good farm management on the part of two or three others. So to that degree it is a community problem, rather than an individual farm problem.

I should hesitate very much, Dr. Curtis, to attempt to take that paper of yours--now, I am being candid--to a group of people that you are going to deal with in these watersheds and submit it to them in a way that they would understand. You are going to have to take that program and adapt it to the locality,

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the type of people, and in terms of practices that they can put into application. Unless something is done about that--we can talk about it--but where the work must actually be done, little can be accomplished whether the job be out on the land or in the forest. My philosophy about that is this. This group that is represented here--the Department of Agriculture, the extension services, and the experiment stations, in cooperation with the Tennessee Valley Authority--in your respective States, might largely take the initiative. Let's pick out a watershed or two; define them; lay out their boundaries; the number of families that are in them; what the problems are; and then set up a program. Include not only the experiment stations, agricultural extension, but all these other agencies, Federal and State, which can make a contribution. I am talking now about the Production and Marketing Administration, the Soil Conservation Service, the Farmers Home Administration, and your Federal and State Forestry Services, and probably your Game and Fish; and bring them into that picture and set up some kind of program.

There are some simple, understandable things that can be done. The program here can be a cumulative program, and you can add to it from time to time as you bring the people along the educational level with the things to be done. I have had that feeling for a good many years. That is the way we should have worked out this relationship with the Soil Conservation Service that we have been wrangling about ever since I have been connected with this outfit here, Dean. You know that. Well, you have asked me for my opinion about it; and I have given it to you. That is not an easy task.

The simplest type--and we in extension know it--the simplest type of education is a simple practice demonstration in teaching a farmer how to grow grass. We have made a tremendous amount of progress in that. But when you begin to teach him how to grow grass and at the same time relate that grass to cows, it becomes a little bit more difficult. Then when you begin to relate the income of those cows to home improvement, that becomes a little bit more difficult. Then when you extend it on beyond to community life, it becomes increasingly difficult. I think you are dealing with something that is vital and fundamental. The approach, as I see it, is for these agencies I have referred to to agree on some program based on sound research. The logical thing, then, is to call your leadership in that community together, and to have your leadership familiar with what we are trying to do. You are never going to get anywhere on this job until you make your leadership, Doctor Curtis, in that watershed area in that community conscious of this fact. I mean not only your adult leadership, but I am persuaded that you have got to make your youth leadership part of this approach, too. I am talking now in terms of the 4-H Club and the Future Farmers, because there is the generation that is going to do it. By the time you get the older people educated about this program, they will have died off. To get anywhere with it--and I am under no illusions on that--you must get over to your leadership in the community what your objectives are in the interests of their welfare and development, and so on; what these relationships are. This takes time, takes thought, and takes pretty careful preparation in the subject matter which we wish to teach. Approach your problem in one or two watersheds along that line, and you have got a fine demonstration; and you can move from one watershed to another. You couldn't take more than one or two if you had to because, it seems we are going to have to learn quite a bit ourselves on methods and procedures as we move from one watershed

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to another. That is as I see it. I am being candid and frank with you about it.

I think all of us are conscious of the importance of the relationships to which you called attention in your statement, Doctor Curtis. I don't need to go into all that with this group. But I do think if you are going to get anywhere you are going to need a pretty carefully planned program to which each agency, Federal and State, can make its proper contribution.

LIST OF MEETINGS

<u>No.</u>	<u>Date</u>	<u>Place</u>	<u>Proceedings</u>
1	1933, September 25	Knoxville, Tennessee	Typed, 2 pp.
2	1933, October 7	Knoxville, Tennessee	Typed, 1 p.
3	1934, July 6-7	Chattanooga, Tennessee	Typed, 8 pp.
4	1934, October 27-28	Muscle Shoals, Alabama	Processed, 13 pp.
5	1935, December 12	Chattanooga, Tennessee	Typed, 15 pp.
6	1936, June 26-27	Chattanooga, Tennessee	Processed, 20 pp.
7	1937, February 6	Knoxville, Tennessee	Typed, 7 pp.
8	1937, July 10	Knoxville, Tennessee	Typed, 10 pp.
9	1937, November 3	Knoxville, Tennessee	Typed, 5 pp.
10	1938, April 25	Knoxville, Tennessee	Typed, 13 pp.
11	1938, October 4	Atlanta, Georgia	Typed, 10 pp.
12	1939, April 4	Birmingham, Alabama	Typed, 9 pp.
13	1939, October 3	Chattanooga, Tennessee	Typed, 10 pp.
14	1940, April 2	Knoxville, Tennessee	Processed, 17 pp.
15	1940, October 1	Asheville, North Carolina	Typed, 9 pp.
16	1941, March 4-5	Florence, Alabama	Processed, 32 pp.
17	1941, October 28	Atlanta, Georgia	Processed, 29 pp.
18	1942, March 3	Roanoke, Virginia	Processed, 13 pp.
19	1942, October 6	Knoxville, Tennessee	Processed, 44 pp.
20	1943, May 13	Atlanta, Georgia	Processed, 20 pp.
21	1944, April 3	Knoxville, Tennessee	Processed, 61 pp.
22	1944, October 3	Birmingham, Alabama	Processed, 74 pp.
23	1945, April 3	Atlanta, Georgia	Processed, 67 pp.
24	1945, October 5	Chattanooga, Tennessee	Processed, 88 pp.
25	1946, April 3	Atlanta, Georgia	Processed, 77 pp.
26	1946, October 2	Biloxi, Mississippi	Processed, 93 pp.
27	1947, April 2	Abingdon, Virginia	Processed, 86 pp.
28	1947, October 1	Knoxville, Tennessee	Processed, 71 pp.
29	1948, April 7	Lexington, Kentucky	Processed, 65 pp.
30	1948, October 6	Asheville, North Carolina	Processed, 94 pp.
31	1949, April 6	Birmingham, Alabama	Processed, 81 pp.
32	1949, October 5	Atlanta, Georgia	Processed, 98 pp.
33	1950, May 12	Memphis, Tennessee	Processed, 155 pp.
34	1950, November 29-30	Knoxville, Tennessee	Processed, 114 pp.

